Ranking the LCA*

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Abstract: The overarching question addressed in this article is how syntactic structures based on constituency (dominance, c-command) are going to be mapped onto linear phonetic strings. The article presents an argument that both prosodic principles and narrow-syntactic principles play a role in the linearization of syntactic structures. I take Richard Kayne's (1994) Linear Correspondence Axiom as a starting point: (asymmetric) c-command maps onto precedence relations. Two wide-ranging consequences of Kayne's theory are that specs precede their heads and that a head can only have one spec or adjunct. Although there is abundant evidence to support these predictions, there is nonetheless a well-known class of apparent counterexamples: dislocations in the Romance languages can be rightward and multiple. I take the LCA to be a soft constraint, overruled by a constraint of the *WRAP* family that seeks to phrase together a verb and its extended projection in one intonational phrase. Apparent rightward movement is the outcome of right linearization forced by WRAP. The possibility of having multiple dislocations is shown to be compatible with the LCA within the assumptions made in this article.

Keywords: LCA, dislocations, Wrap, prosody, Romance, Spanish,

1. The LCA and dislocation.

Kayne's (1994) influential Linear Correspondence Axiom (LCA) puts forth the hypothesis that there is a direct mapping between syntactic structure and linear order. Informally, it can be stated as in (1):

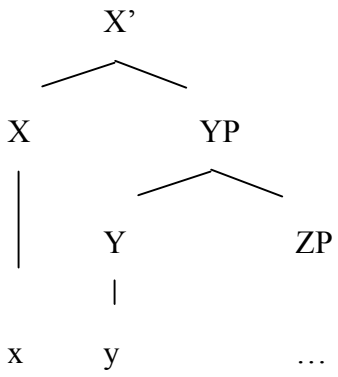
(1) *LCA*: Take X,Y, non terminal nodes that dominate the terminals x,y respectively. Take X to c-command Y while Y does not c-command X (asymmetric c-command). Then x precedes y.

The notion of c-command that Kayne uses is as follows:

(2) X *c-commands* Y iff X and Y are categories and X excludes Y and every category that dominates X dominates Y. (Kayne 1994: 16).
X *excludes* Y if no segment of X dominates Y. (Chomsky 1986:9).

For illustration, consider example (3): [1]

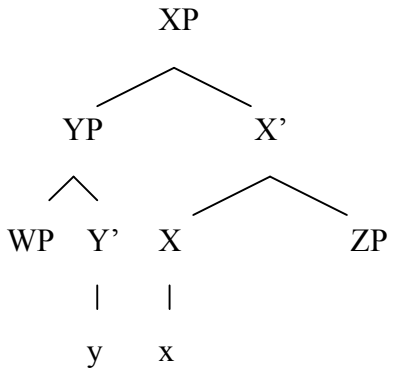
(3)



Let's see how the LCA linearizes the terminals x and y. In order for these terminals to linearize there must be a pair of non terminals X and Y such that X dominates one of x or y, Y dominates the other and X and Y stand in an asymmetric c-command relationship. Consider the pair X,YP. Notice that they c-command one another, so they do not help us establish a precedence relation. Consider instead X,Y. X asymmetrically c-commands Y. this establishes the ordered pair <x,y>, such that x precedes y.[2]

Kayne considers all specs to be adjuncts. The definition of c-command that Kayne uses, which includes a segment-category distinction (harking back to May 1985, Chomsky 1986), allows him to ensure that specs are always to the left of their heads. Consider example (4):

(4)



If X' and Y' are not categories (but only segments), X' and Y' do not participate in c-command relations. YP asymmetrically c-commands X. Notice that X does not c-command YP because there is a category, XP that dominates X but does not dominate YP (only a segment of XP dominates YP). Thus, the order <y,x> obtains. Consequently, specs (adjuncts) must precede heads.

If we do not adopt the segment-category distinction, X' and Y' are c-commanding categories on their own right. Under this assumption, YP asymmetrically c-commands X while X' asymmetrically c-commands Y': we have the pairs <y,x> and <x,y>. These contradictory ordering instructions lead the derivation to a crash.

There is indeed abundant empirical evidence that specs are merged/adjoined "to the left": wh-movement,[3] focus movement, topicalization and NP-raising always target positions to the left. In the Romance languages, we have Clitic Left Dislocation (CLLD), which also displaces a constituent leftwards. But there is a second type of dislocation in this language family that appears in a position to the right of the other constituents within the clause. It is usually referred to as Clitic Right Dislocation (CLRD) (examples are in Spanish except those prefixed with a C (=Catalan)):

(5) a. No lo quiso comprar, el reloj CLRD

NEG CL.ACC want.PAST.3SG buy.INF the watch

'She/he did not want to buy the watch.'

b. El reloj, no lo quiso comprar. CLLD

the watch NEG CL.ACC want.past.3SG buy.INF

As I show below, there is no doubt that CLRD involves movement and not just deaccenting (crucially, this movement is to a mid-field position as initially argued for by Cecchetto 1999 for Italian and Villalba 1999, 2000 for Catalan). So, at first blush, this datum seems to constitute direct counterevidence against Kayne's LCA. The puzzle has been noted and analyses have been proposed, based on some form of remnant movement, which I summarize in a later section (Cecchetto 1999, Villalba 2000, Frascarelli 2000, Belletti 2004, Samek-Lodovici 2006). Here I try a different tack. First I dispense with the idea that constituents move "to the left" or "to the right" in narrow syntax. The only relations understood by narrow syntax are those of dominance and c-command (see Chomsky 1995 and Uriagereka 1999 on this). Second, whether two terminals spell-out as xPy or as yPx is a matter decided in the mapping from syntax to PF. Third, the LCA is an operational principle in this mapping from syntax to PF, but not the only one. The LCA should be regarded as a soft constraint that can be violated if a stronger prosodic requirement needs to be satisfied.

The analysis proposed in later sections can be summarized as follows. It has been argued that dislocates in Romance form their own intonational phrases: Zubizarreta (1998) for Spanish, Frascarelli (2000) for Italian, Frota (2000) for Portuguese, Astruc (2005) and Feldhausen (2006) for Catalan. I take it that a high ranked Align constraint is at work. Furthermore, Truckenbrodt (2005) proposes a prosodic constraint that ensures that a CP will be contained in one intonational phrase. Taking Truckenbrodt's ideas as a starting point, let's assume a constraint that ensures that a verb and its extended projection (in the sense of Grimshaw 1991) are included in the same intonational phrase. Now consider the following structures:

(6) a. $[_{CP} (_{I} \ldots \text{CLRD})(_{I} \ldots)]$

b. $[_{CP} (_{I} \ldots)(_{I} \text{CLRD})(_{I} \ldots)]$

c. $[_{CP} (_{I} \ldots)](_{I} \text{CLRD})$

CLRD moves to a position intermediate between v and T (Cecchetto 1999, Villalba 2000, López 2003). If CLRD is linearized to the left, we obtain the intonational structures in (6a) or (6b), depending on whether the CLRDed constituent involves only Align-Right or both Align-Right and Align-Left. Either structure breaks the extended projection of the verb into two intonational phrases, although the LCA, since it linearizes the spec to the left, is respected. However, if CLRD is linearized to the right, as in (6c), the entire extended projection of the verb is contained within one intonational phrase although the

LCA is violated. I claim that the rightward linearization of CLRD is consequence of the higher ranking of the extended projection constraint.

Romance dislocations, whether to the left or to the right, can be multiple:[4,5]

(7) a. Juan, los libros, a María, no se los dará.
Juan the books DAT Maria NEG CL.DAT CL.ACC give.FUT.3SG
'Joan won't give Mary the books.'

b. No se los dará, Juan, los libros, a María.
NEG CL.DAT CL.ACC give.FUT.3rd.SG Juan the books DAT Maria

c. No se lo dará, cada libro, a su autor.
NEG CL.DAT CL.ACC give.FUT.3SG each book DAT its author
'He will not give each book to its author.' (bound reading √)

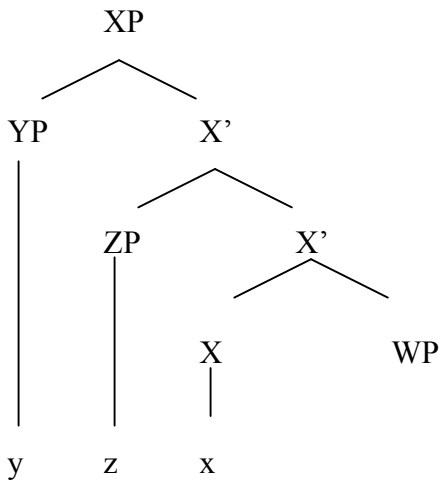
d. No se lo dará, a su autor, cada libro. (bound reading *

The order of the dislocates is free but, as I show in (7c) and (7d), they are structurally asymmetrical: the first one c-commands the second and so on (as originally pointed out by Villalba 2000 for Catalan). This fact is interesting. The position of the CLRDed constituents with respect to the core clause violates the LCA, but the positioning of the dislocates *with respect to one another* obeys it. That is, although the phenomenon of right dislocation could lead us to the conclusion that there is no LCA or that it is somehow suspended in this type of structure, the asymmetric relation of the dislocates shows us

that the LCA is, after all, operative exactly in the same structure in which it appears to be violated.

Kayne sets up the LCA so that multiple specs are not possible. Consider the structure represented in (8):

(8)



In (8), YP and ZP c-command one another, given the definition of c-command in (2). Since there is no asymmetric c-command, there is no ordering of the terminals y and z. This leads to a crash.

At first blush, it seems that the presence of multiple dislocation in Romance poses another problem for Kayne's LCA. There have been three types of analyses of multiple dislocations: Rizzi (1997) proposes a recursive Topic Phrase, such that each Topic Phrase includes exactly one dislocated constituent. Frascarelli (2000) suggests multiple specs/adjuncts, although without resolving the linearization problem that Kayne

discusses. Finally, Villalba (2000) proposes that dislocates can themselves be the target of other dislocates, forming a cluster. I discuss these approaches in a later section.

The issue of multiple specifiers is controversial beyond dislocations. Syntacticians working within the minimalist program have adopted Chomsky's Bare Phrase Structure, which does allow for multiple specifiers. Notice, however, that Chomsky's and Kayne's positions are not contradictory in principle. If we take the LCA to apply in the syntax-PF interface, it could well be the case that phrase structure, *per se*, does not prevent multiple specifiers but the possibility is filtered out by linearization requirements at the interface with PF. However, multiple nominatives in Japanese and Hebrew (Ura 1996, Doron and Heycock 1999), scrambling in Japanese (Grewendorf and Sabel 1999) and multiple wh-movement in Slavic and Romanian (Boskovic 1998, Richards 2001) have been analyzed as examples of multiple specifiers. Although there is no such thing as an established analysis, I take it that the accumulated evidence points to the existence of multiple specifiers in natural language. I claim that multiple dislocation should be taken as another example of multiple specifiers. Accommodating multiple specifiers will turn out to be natural and compatible with the spirit of the LCA within the assumptions presented in section 3.

The rest of this article is organized as follows. Section 2 presents some basic facts of Spanish dislocations. Section 3 presents my framework of analysis, which involves a simpler definition of c-command and explicit algorithms for the linearization of terminals and prosodic computation. Section 4 presents the analysis, showing how a prosodic constraint that forces lexical verbs to form intonational phrases with their extended

projections trumps the LCA and forces mid-level dislocations to linearize to the right. Section 5 discusses multiple dislocation. Section 6 presents the conclusions.

2. The syntax of dislocations in Spanish

The neutral word order in Spanish is subject-verb-complements-adjuncts. This order is not rigid, since there is p-movement in Spanish (Zubizarreta 1998) as well as dislocation. In situ constituents are part of the domain of information, non-contrastive focus. Dislocated constituents in Romance are usually described as being topics or discourse links (see Vallduví 1990, Rizzi 1997, among many others). CLLD and CLRD in Romance are indeed obligatorily linked to an antecedent. I assign CLLD and CLRD the feature [+a], which is meant to evoke this anaphoric property. Whether a constituent is right or left dislocated depends on their relationship with the antecedent. CLRDed constituents stand in an identity relation with their antecedents, CLLDed constituents are linked by a more complex relation, involving some quantification domain (set/member, set/subset, whole/part, see Villalba 2000). I attribute to CLLDed constituents the feature [+c] (evoking kontrast as defined in Vallduví and Vilkuna 1998).[6]

Structurally speaking, CLLD and CLRD are not in symmetric positions. As argued by Cecchetto (1999) and Villalba (2000) CLRD constituents are in a mid-field position, while CLLD are high in the structure. Some data concerning quantifier-variable relations will help me show it. A left dislocated quantifier can bind a variable in a right dislocated constituent. The opposite does not hold:

(9) a. A cada niño, María se lo dio, su libro.
DAT every boy Maria CL.DAT CL.ACC give.PAST.3SG his book
'Maria gave every boy his book.' (bound reading √)

b. Su libro, María se lo dio, a cada niño (bound reading *)

c. Cada libro, María se lo dio, a su autor. (bound reading √)

d. A su autor, María se lo dio, cada libro. (bound reading *)

Their position with respect to subjects is also distinct. While a quantifier in a CLLD constituent can bind a variable in a preverbal subject position, a quantifier in CLRD cannot do so, as shown in (10a,b). Interestingly, a CLRD quantifier can bind a variable in a post-verbal subject, as shown in (10c):

(10) a. [Context: Did the children read the book?]
Sí. A cada niño, su madre se lo hizo leer,
Yes DAT every boy his mother CL.DAT CL.ACC make.PAST.3SG read.INF
el libro.
the book
'Yes. His mother made every child read the book.' (bound reading √)

b. [Context: What happened to every child? What did every child's mother make them read?]

Su madre le hizo leer el libro, a cada niño.

his mother CL.DAT make.PAST.3SG read.INF the book DAT every child

'His mother made every child read the book.' (bound reading *)

c. [Context: Who made every boy read the book?]

Se lo hizo leer su madre, el libro,

CL.DAT CL.ACC make.PAST.3SG read.INF his mother the book

a cada niño.

DAT every child

'His mother made every child read the book.' (bound reading √)

(10c) gives us a first hint that a CLRDed constituent has moved to a mid-sentence position. I use ditransitive predicates to provide additional evidence that CLRD involves movement to an intermediate position. The structure of the argument is the following: when we have a Spanish double object construction with the order IO>DO, the first one asymmetrically c-commands the second. But when the DO is dislocated, then the DO c-commands the IO.

As shown by Demonte (1995) and Bleam (2004), ditransitive predicates with the dative clitic function in Spanish very much like double object constructions in English.[7] When we have this sort of ditransitive the IO asymmetrically c-commands the DO if the IO precedes the DO. This analysis entails that the IO is a DP and *a* is a marker of dative

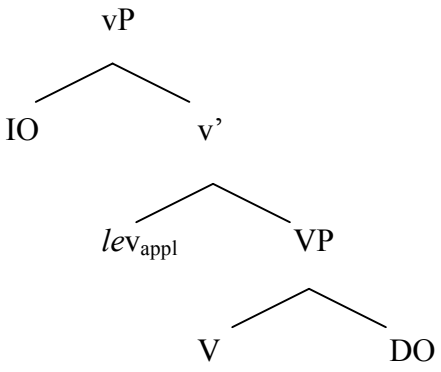
case and not a preposition. This asymmetry is exemplified in the following example using a quantifier in the IO and a variable in the DO:

(11) a. Le entregué a cada autor una copia de su libro.
CL.DAT give.PAST.1SG DAT each author a copy of his book
'I gave each author a copy of her/his book.' (bound reading √)

b. Le entregué a su autor cada copia del libro (bound reading *)
'I gave her/his author each copy of the book.'

The following tree, inspired by Marantz (1993) and Demonte (1995) captures the asymmetry:

(12)



But CLRDed DO can c-command an IO:

(13) [Context: What did you do with the books. Did you throw them away?]

No, se lo entregué a su dueño, cada libro.

No CL.DAT CL.ACC deliver.PAST.1SG DAT his owner every book

'I gave each book to its owner.'

This I take to be evidence that the dislocated object has moved above the IO.

We find the same result if we apply this test in reverse. A negative quantifier in IO position can bind a variable in the DO. However, if the DO is dislocated, this binding is not possible:

(14) a. No le entregué a ningún cliente su chaqueta.

NEG CL.DAT give.PAST.1SG DAT any costumer his jacket

'I didn't give his jacket to any customer.' (bound reading √)

b. No se la entregué a ningún cliente, su chaqueta.

NEG CL.DAT CL.ACC give.PAST.1SG DAT any costumer his jacket

(bound reading *)

Notice that this strongly suggests that there is no reconstruction, hence we have an instance of A-movement (see Lasnik 2002, and references therein, on this topic). That we are dealing with A-movement is confirmed by the presence of floating quantifiers:

(15) No se los envió todos ayer, los libros

NEG CL.DAT CL.ACC send.PAST.3SG all.PL yesterday the books

'She/he didn't send all the books yesterday.'

Assuming that A-movement creates the context for the appearance of floating quantifiers (Sportiche 1988), example (15) suggests that there must have been A-movement of the DO.[8]

Principle-C effects help us reach the same conclusion. In (16a), the pronoun in IO position c-commands the DO, making co-reference impossible. In (16b), the same co-reference is possible, which suggests that the DO is out of the c-command domain of the IO:

(16) a. Le devolví a ella el libro de Anna Tusquets.

CL.DAT give.PAST.1SG DAT her the book of A.T

'I returned Anna Tusquets' book to her.' (bound reading *)

b. [Context for 16b: Who did you return A.T.'s book to?]

Se lo devolví a ella, el libro de Anna Tusquets.

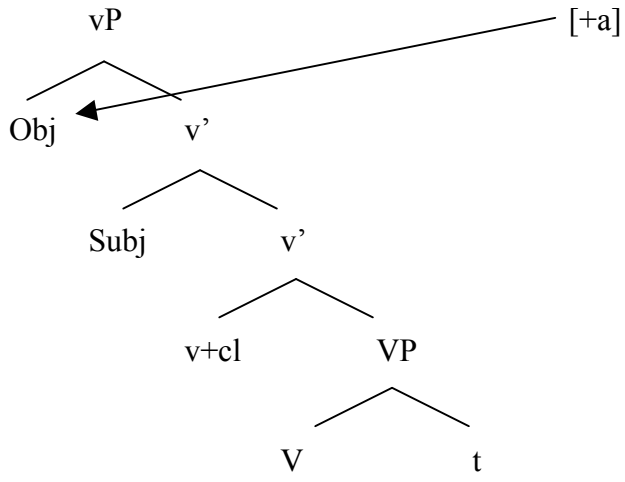
CL.DAT CL.ACC give.PAST.1SG DAT her the book of A.T.

(bound reading √)

Thus, the CLRDed has moved some, but not much: a right dislocated complement enlarges its c-command domain to embrace a post-verbal subject (see (10)) or a verbal complement that would normally be higher.

I adopt López (2003) analysis of right dislocation, as shown in (17). López (2003) claims that CLRDed constituents are in Spec,v. Further, I argue that [+a] is assigned to Spec,v by a component that I call *pragmatics* (see Chomsky's 2001 analysis of Icelandic object shift), while the complement of v is [-a], i.e., not discourse anaphoric. Thus, pragmatics is an interpretive module that assigns information structure features such as [±a] and [±c]. I argue that this module interfaces with the computational system at the end of each phase. Alternatively, the feature [+a] could be assigned to the object as it is drawn from the numeration/lexical array (as explicitly claimed in Erteshik-Shir 2006) and raised to Spec,v to satisfy a well-formedness filter (as in the Criteria system of Rizzi and others). The mechanics of how complements end up being [±a] is unimportant to us, what is crucial is that an object in Spec,v is [+a] while an object in situ is [-a]. In López (2003) it is further claimed that object clitics are constituents of v's morphology :

(17)



Further, I assume that this annotated syntactic structure is what is fed to the prosodic computation. Prosodic computation is sensitive to the [+a] feature and the presence of the clitic, as I show below.

In contrast, CLLD is higher than the preverbal subject, as shown above. Where exactly does a CLLDed constituent go? I believe that the empirical evidence presented by Rizzi and others that CP should be split into a Finite Phrase and a Force Phrase is compelling, so I adopt it here. The phenomenon of recomplementation in Romance (see Uriagereka 1988 for a first generative description) should probably be analyzed as an instance in which both Force and Fin are phonetically expressed. We can observe that a CLLDed constituent sits between the two *que*:

(18) a. Creo [$_{\text{ForceP}}$ [$_{\text{Force}}$ que] los libros Fin [$_{\text{TP}}$ los trajo María]]
think.1SG that the books CL.ACC bring.PAST.3SG Maria
'I think that Maria brought the books.'

b. Dicen [$_{ForceP}$ [$_{Force}$ que] los libros [$_{Fin}$ que] [$_{TP}$ los trajo María]]

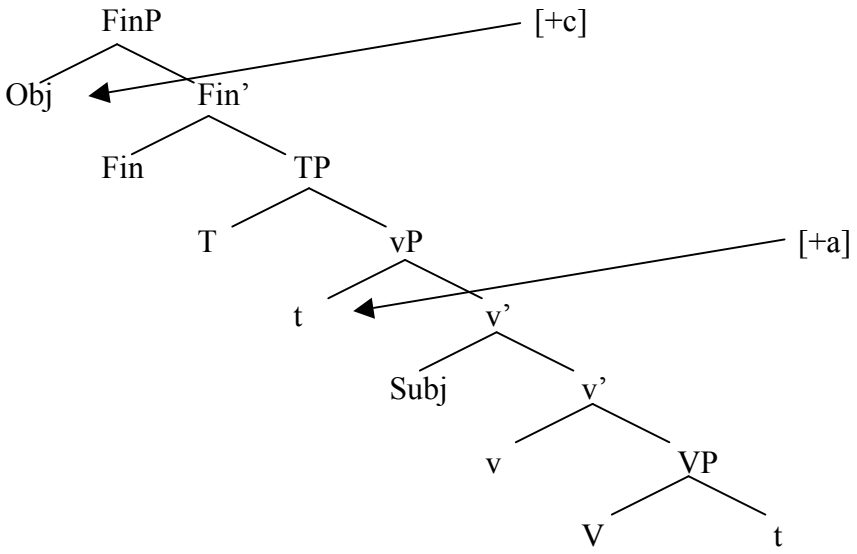
say.3PL that the books that CL.ACC bring.past.3sg Maria

'They say that Maria brought the books.'

Thus, I conclude that CLLD sits somewhere between the heads Fin and Force, as generally assumed under the influence of Rizzi (1997). This position can be Spec,Top as in Rizzi's work or Spec,Fin, as in López (2003).

In López (2003) it is argued that the feature [+c] is assigned to constituents in the left periphery, including CLLD as well as constituents moved by focus-movement or wh-movement. In order to account for the fact that CLLD is both [+a] and [+c], I present an analysis in which the left dislocated constituent stops in Spec,v, where it becomes [+a] and then moves on to Spec,Fin (again, an analysis based on Criteria and/or Topic Phrase serves the purposes of this article equally well):

(19)



To sum up section 2: empirical evidence shows that CLRD is in a mid-level position in the clause structure while CLLD is in a high position. Both CLLD and CLRD are anaphoric, with CLLD bearing an additional feature of contrast.

3. C-command, linearization and prosodic structure

This section presents the theoretical assumptions that ground my analyses. I start by presenting a simple definition of c-command. In section 3.2, I discuss the LCA and present a version of it that allows us to maintain a bare phrase structure. Section 3.3 discusses the construction of prosodic trees while 3.4 argues that prosodic computation and linearization should be regarded as simultaneous operations. Sections 3.5 and 3.6 discuss the domain of intonational phrases.

3.1 C-command

I propose to go back to Reinhart's original intuition, based on first branching node, without enriching our structural assumptions with the segment-category distinction. Assuming a derivational approach to syntax, Epstein's (1999) definition of c-command is very natural: if x and y merge, x c-commands y and everything y dominates. This compares favorably with the sort of definition that Kayne uses, repeated here as (20b):

(20) a. 1. aCb if Merge (a,b).

2. If aCb and bDc, then aCc.

b.(=2) X c-commands Y iff X and Y are categories and X excludes Y and every category that dominates X dominates Y.

X excludes Y if no segment of X dominates Y. (Chomsky 1986:9).

Notice that (20b) entails that two categories which are not sisters and are connected only by being adjoined to the same category are linked by a relation like c-command. On the other hand, there is no structural relation between a constituent and its sister X': they are not linked by c-command or dominance. It is hard to see what intuition this definition of c-command responds to.

3.2 Linearization

As suggested above, I incorporate Chomsky's (1995) suggestion that linearization should be a matter to be resolved at the syntax-PF interface. Recall that Kayne wanted the LCA to be a well-formedness condition on phrase structure. Let's look at the LCA a little more closely.

Kayne's proposal revolves around a theory of phrase structure that includes some features that later theories (under Chomsky's 1995 influence) have been trying to avoid: the category-segment distinction, vacuous projections, a distinction between an X^0 and a terminal. In order to work within a phrase structure that avoids this distinctions, I revisit the LCA along the following lines:

(21) Two-step LCA (TLCA)

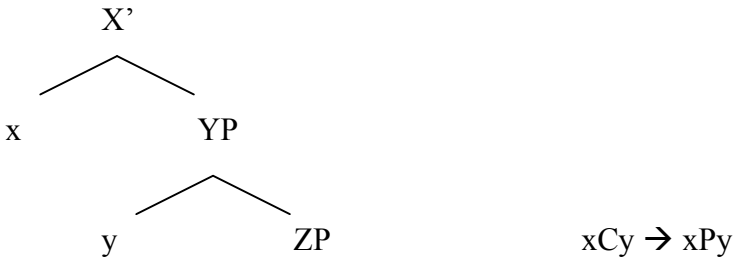
Take x,y terminals.

1. If x c-commands y, x precedes y
2. If x and y do not stand in a c-command relation then

   if x^{max} c-commands y, x precedes y.

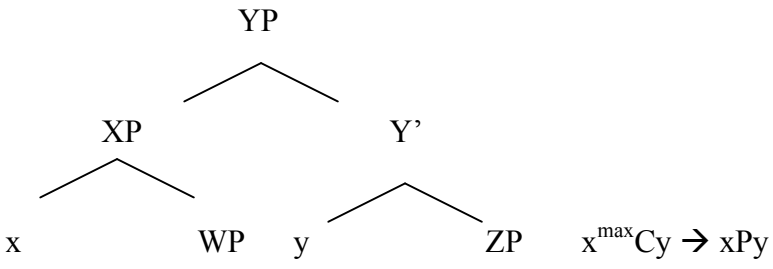
The first clause of the TLCA ensures that heads precede their complements, since a head always c-commands the head of the complement, as shown in (22a). Clause 2 of the TLCA ensures that specs precede complements, as shown in (22b). In (22b) x does not c-command y and y does not c-command x. That is when clause two of the TLCA intervenes. Since x^{max} c-commands y, x precedes y. y^{max} dominates x, so no precedence relation arises from this relationship:[9]

(22) a.



xCy → xPy

b.



x^{max}Cy → xPy

The output of linearization is a set of ordered pairs <α,β> such that the first precedes the second or, what amounts to the same thing, a string.

My discussion of (22b) leaves out one loose end: the head of WP, call it w, and y are not linearized. We obtain that xPw and xPy, but we do not yet obtain wPy. I address this in 3.4.

Kayne defines the LCA as a procedure to derive precedence relations from c-command relations. I propose instead that the LCA be taken to be a soft constraint. Working from the bottom up, an operation LIN takes a pair of terminals x and y and establishes two precedence relations, xPy and yPx. These two pairs form what linguists in the OT tradition call a *candidate set*: one of the two must be chosen, the one that best fits the ranked prosodic and linearization constraints. LCA is a filter that ensures that the precedence relation mirrors a c-command relation. Once x and y are linearized, LIN takes the c-commanding terminal and linearizes it with the next one up. This procedure continues until all terminals are linearized.

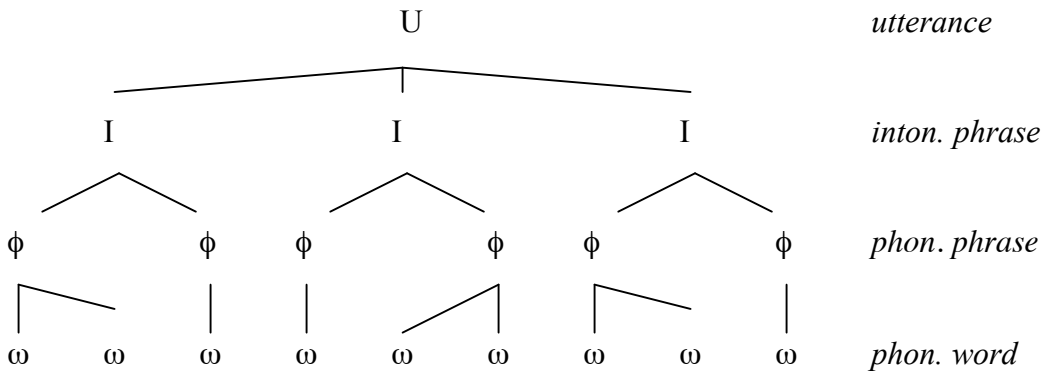
3.3 Prosodic computation

Following Selkirk (1984) and many others, I assume that syntactic structures map onto prosodic trees and the latter feed PF. Thus the output of the syntactic component (usually referred to as *the* computational system of human language (C_{HL}) although more than one computational system can be found in human language) feeds another computational system, which I refer to as P(rosodic)-computation, which feeds PF:

(23) C_{HL} → P-computation → PF

Still under the inspiration of Selkirk (1984), I assume an architecture that includes phonological words, phonological phrases and intonational phrases which bundle together in an utterance.[10] Note that prosodic trees are exhaustive (Nespor and Vogel 1986) and non-recursive (Selkirk 1984). For our purposes, we can take exhaustivity and non-recursion to be inviolable constraints:

(24)



Within each level, the relationship between the constituents is asymmetrical. Within a branching Φ-phrase, one of the phonological words is "strong" while the other is "weak". Strength and weakness is decided by nuclear stress. Thus, Φ-phrase can be defined as a sequence of phonological words clustered around a phonological word that bears the nuclear stress of the phrase. Likewise, an I-phrase is made up of Φ-phrases that gravitate around a nuclear stress and, finally, an Utterance is a sequence of I-phrases that contain one nuclear stress (see Nespor and Vogel 1986 for extended discussion).

The literature on the topic agrees that two constraints are crucial in the construction of prosodic trees. The first one is *ALIGN* (which goes back to Selkirk 1986), which forces the boundary of a syntactic XP to be coterminous with the boundary of a phonological phrase. In some languages, this boundary will be the left one, in others the right one.[11]

The second constraint is *WRAP* (Truckenbrodt 1999), which says that every syntactic phrase with a lexical head must be contained in a phonological phrase. Align and Wrap may be in conflict. A simple example will suffice to see how they interact. Let's take a language with complements to the left and ALIGN-Right. Then ALIGN-Right triggers a Φ-boundary coterminous with the right boundary of the verbal complement. Assuming no recursion, the V ends up phrasing on its own. WRAP wants the entire VP to be contained within one Φ-phrase:

(25) a. $[_{VP}$ (DP) (V)] → ALIGN-Right

b. $[_{VP}$ (DP V)] → WRAP

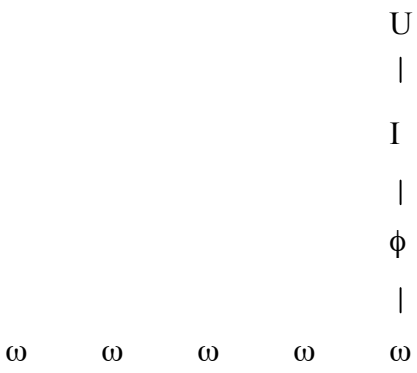
Truckenbrodt proposes that both ALIGN and WRAP are violable constraints (Selkirk had already proposed that ALIGN is violable). A higher ranking of ALIGN-Right gives rise to the phrasing in (25a) while higher ranking of WRAP gives us (25b).

As for the construction of intonational phrases, I assume that another ALIGN constraint triggers the erection of intonational boundaries. I annotate the two types of ALIGn as ALIGN(ϕ) and ALIGN(I) to distinguish them. Although every maximal syntactic

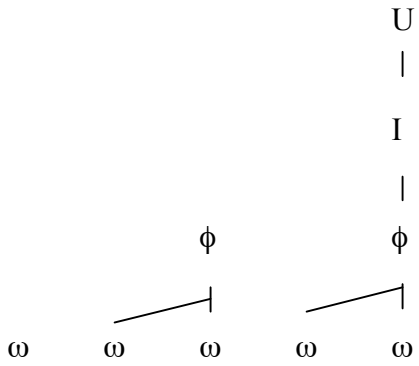
projection triggers ALIGN(ϕ), only some types of syntactic boundaries trigger ALIGN(I), as I explain below.

Let me now present a simple model of how a tree like (24) is constructed. I assume a bottom-up computation of prosodic structure that recapitulates the bottom-up construction of syntactic trees. I further assume that this computation goes step by step taking one phonological word at a time.

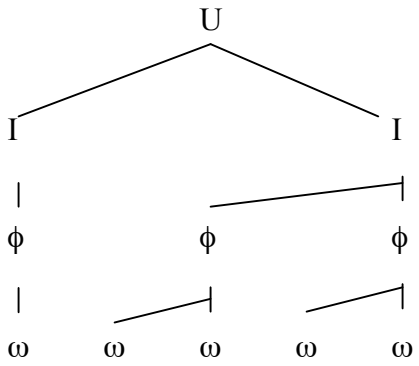
(26) a. Step 1: the right-most phonological word projects a phonological phrase an intonational phrase and an utterance.



b. Step 2: each subsequent word is linked to the phonological phrase. If ALIGN(ϕ)–Right is ranked higher than WRAP-XP, every lexical XP boundary initiates a new phonological phrase and the old one closes. ALIGN(ϕ)-Right can be trumped up in a language in which WRAP-XP is a stronger requirement, as mentioned.



c. Step 3: each subsequent phonological phrase is linked to the intonational phrase, until it finds the right edge of a new intonational phrase, that is, a syntactic boundary that triggers ALIGN(I). At this point, the old intonational phrase closes and a new one opens:



One way of interpreting this procedure is to assume that every prosodic unit has an "edge feature", the same as or similar to what Chomsky (2005) proposes to account for the Merge operation in narrow syntax. I take it that an edge feature is essential to any computational system, be it narrow syntax of P-computation. This edge feature allows a prosodic unit to expand to the left or to the right. A consequence of assuming that P-computation is triggered by an edge feature is that once a prosodic unit is closed it

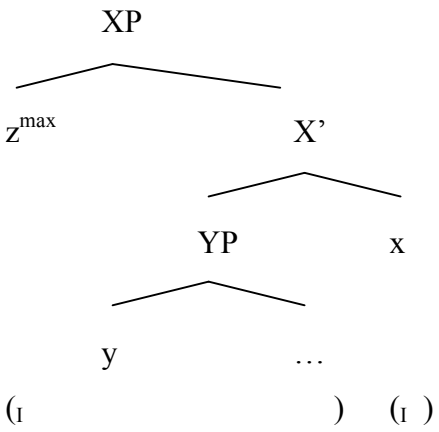
becomes solid - crucially, a prosodic unit cannot be altered in the middle (in other words, the No Tampering Condition (NTC) of Chomsky 2005 regulates P-computation as much as syntactic computation).

Additionally, notice that the default operation is expansion of units rather than creation of new units. Creation of new units only takes place when the old ones reach a boundary erected by Align. I take this to be derived from the general constraint *STRUCTURE, which seeks to avoid the construction of any structure (Prince and Smolensky 1993/2004, see also Truckenbrodt 2005).

3.4 Linearization and P-computation

Take a lexical item x that takes YP as a complement, y being the head of YP. Let's consider the linearization of x and y. If the LCA is all there is, then we obtain xPy. Assume instead that a constraint higher ranked than the LCA leads to the ordering yPx instead of xPy. Do we have the string y,x,… or rather y,…,x? Or, in other words, does x follow y or YP? I believe that the assumption of an edge feature and NTC leads us to the latter. YP forms a prosodic domain that cannot be altered, only extended at the edge. If we had y,x,… we would be forced to undo the previous P-computation and redo it again. Thus, if the LIN procedure forces y to precede x, x will have to go to the first place where it does not alter the prosodic structure of YP, i.e., to the far right:

(27)



I can now address an issue that I left open in the previous section. Consider (22b) again. As pointed out, the terminals w and y remain unlinearized within the TLCA since neither the terminals themselves nor the maximal projections WP and YP stand in any c-command relation. The solution comes again from the NTC. The spec XP forms its own Φ-phrase. The ordering yPw would force us to break this Φ-phrase, while the ordering wPy does not hurt anywhere. Taking NTC to be a high-ranked constraint, it follows that once x has been linearized to the left of y, everything else within XP will also be linearized to the left of y.

There is only one final question that needs to be addressed before I finish this section. We have that both LIN and P-Computation stand at the syntax-PF interface. How should P-computation and Linearization be ordered? There are three possibilities to consider:

(i) P-computation is ordered after Linearization.

(ii) Linearization is ordered after P-computation.

(iii) Linearization and P-computation should apply simultaneously.

(i) does not seem likely. As we know, the input of P-computation is a syntactic structure. But if we order LIN before P-computation, all that P-computation has to work on is a string of terminals (a set of ordered pairs), from which all syntactic information is gone. (ii) is afflicted with a similar problem. LIN requires c-command relations among constituents to turn them into precedence relations, but the output of P-computation, which eliminates the recursion of syntax, makes c-command relations opaque. Moreover, (ii) entails that P-computation can take place on a non-linearized structure, which is implausible. Thus it seems that Prosodic computation and LIN should take place simultaneously, possibly as one single computation:

(28) C_{HL} → PL-computation → PF

3.5 Intonational phrases

What constitutes an intonational phrase? First: a full clause. Second, a dislocated constituent.

That a clause forms its own intonational phrase was already pointed out by Nespor and Vogel (1986) and recently given some further development by Selkirk (2005). This includes clauses with a wh-phrase or with a fronted focused constituent (on the latter, see particularly Frascarelli 2000).

(29) a. ($_I$ John bought a book)

b. ($_I$ what did you say?)

c. ($_I$ the BOOKS he bought)

Additionally, it has been argued that dislocates in Romance form their own intonational phrases when they are in a matrix clause, as can be shown in (30a,b)(Zubizarreta (1998) for Spanish, Frascarelli (2000) for Italian, Frota (2000) for Portuguese, Feldhausen (2006) for Catalan). Example (30c) shows that CLLDed constituents in subordinate clauses also introduce a new intonational phrase (Frascarelli (2000), Feldhausen (2006)). (30c) also reflects Feldhausen's finding that in Catalan the subordinate CLLDed constituent forms an intonational phrase with the matrix clause: [12]

(30) a. ($_I$ los libros)($_I$ los compró Juan ayer)

the books CL.ACC buy.PAST.3SG Juan yesterday

'The books Juan bought yesterday.'

b. ($_I$ los compró Juan ayer)($_I$ los libros)

c. C ($_I$ El Joan diu que els llibres)($_I$ els va comprar ahir)

the Joan says that the books CL.ACC PAST.3SG buy.INF yesterday

Truckenbrodt (2005:286) takes the observation that clauses form an intonational phrase and proposes the constraint WRAP(I)-CP:

(31) WRAP(I)-CP: each CP is contained in a single intonational phrase.

(Truckenbrodt 2005: 286)

Let's see what predictions WRAP(I)-CP makes. (32a) violates WRAP(I)-CP: there are two intonational phrases but no intonational phrase that includes the entire CP. WRAP(I)-CP is satisfied in (32b):

(32) a. *$[_{CP}\ [_{\alpha}\ (_{I}\ \ldots)\ ]\ (_{I}\ \ldots)\ ]$

b. √$[_{CP}\ (_{I}\ \ldots)]$

Let's look at (32) from another point of view. Assume that there is no ALIGN(I) constraint that forces the erection of an intonational phrase at the right boundary of α. If so, (32a) is ruled out because of the P-computation algorithm set-up above: if nothing forces a new intonational phrase, then the first one simply keeps extending to the left. Thus the effect of WRAP(I)-CP is limited to prevent the intrusion of a constituent α that triggers ALIGN(I).

Truckenbrodt extends the application of WRAP(I)-CP to configurations such as those in (33), with CP subordination:

(33) a. *$[_{CP}\ [_{\alpha}\ (_{I}\ \ldots)\ ]\ [_{CP}\ (_{I}\ \ldots)]]$

b. √$[_{CP}\ (_{I}\ \ldots[_{CP}\ \ldots)]]$

According to Truckenbrodt, (33a) is starred because the root CP is not contained in one intonational phrase. The effect of this is that if α is a CLLDed constituent, it should not trigger ALIGN(I). However, I have shown that CLLD constituents in subordinate CPs do trigger ALIGN(I), even in subordinate sentences (see (30c)).

Let's take α to be a constituent that does not trigger ALIGN(I). Then, the * of (33a) can be derived from the P-computation algorithm, just like (32a). The lower intonational phrase does not have to close, since it has not reached any right boundary. The algorithm then forces it to keep growing, ensuring that the second intonational phrase does not even get started.

(33b) is good because both CPs are contained in one intonational phrase – the fact that the intonational phrase is the same for both CPs is of no importance.

Given the problem that CLLD presents for Truckenbrodt's WRAP(I)-CP, I would like to propose the following alternative:

(34) WRAP(I)-EPV: The lexical verb and its extended projection are contained in a single intonational phrase.

WRAP(I)-EPV ensures that the lexical verb, the little v and T all form part of the same intonational phrase. In Grimshaw's (1991) original formulation, C was also part of the extended projection of V. But if we split C into Force and Fin, the question arises: are both part of the extended projection of V?

For Fin, the answer should be yes. As Rizzi explains, Fin "looks down", since it decides whether the clause is finite or non-finite, the information Fin presents is similar to that of T, in rough form. As for Force, intuitively it seems to me that it should not be regarded as part of the extended projection of the verb because Force "looks up": it links with the subordinating sentence and carries features related to the connection of the sentence with the previous discourse.

Suggestive evidence that Force is not included in the extended projection of the lexical verb comes from code-switching. As Belazi, Rubin and Toribio (1993) and González-Vilbazo (2005) have demonstrated, it is not possible to code-switch within an extended projection:

(35) *John said that *Juan es inteligente*.
is intelligent

However, the picture changes when we introduce recomplementation. As suggested above, I assume that recomplementation allows us to separate Force from Fin:

(36) a. Dicen que los libros que los traen mañana.
say.3PL that the books that CL.ACC bring.3PL tomorrow
'They say that they will deliver the books tomorrow.'

b. dicen [$_{\text{ForceP}}$ [$_{\text{Force}}$ que] los libros [$_{\text{Fin}}$ que] …]

According to two code-switchers, it is only the lower complementizer that has to be lexicalized in the same language as the lexical verb:[13]

(37) a. ?They say that *los libros que los traen mañana*. (Eng→Spn)
the books that CL.ACC deliver.3PL tomorrow

b. *They say that the books that los traen mañana.

(38) a. Sie sagen dass *los libros que los traen mañana*. (Gr→Spn)
they say.3PL that the books that CL.ACC deliver.3PL tomorrow
'They say that they will deliver the books tomorrow.'

b. *Sie sagen dass die Bücher dass *los traen mañana*.

Thus, I conclude that Force is not part of the extended projection of the verb. As a consequence, WRAP(I)-EPV forces V, v, T and Fin to be in the same intonational phrase, but not Force.

With respect to the configurations in (32), WRAP(I)-CP and WRAP(I)-EPV make the same predictions. Let's first take α to be lower than Fin. I consider (32a) first. If α does not trigger ALIGN(I), (32a) is ruled out by the mechanics of P-computation. Consider now the possibility that α does trigger ALIGN(I). Then (32a) violates WRAP(I)-EPV. This is because the intonational phrase created by α forces a split of the extended projection of the verb into two intonational phrases. This is precisely the configuration

that arises in CLRD (see 6 above). (32b) is grammatical because the FinP is contained within one intonational phrase.

Let's now take α to be above Fin. Then α can erect an intonational phrase without a violation of WRAP(I)-EPV. This is what obtains in CLLD configurations.

We turn our attention to (33). As I claimed above, (33a) is ruled out independently of WRAP(I) if no ALIGN constraint forces the introduction of a new intonational phrase – thus, in the simplest case, an intonational phrase embraces the subordinate and the superordinate clauses, as desired – and shown in (33b).

However, let's take α to be a CLLDed constituent: located higher than the subordinate Fin and able to trigger ALIGN(I). In this case, Truckenbrodt's system and mine make different predictions. As we saw, Truckenbrodt's system rules out (33a) as a violation of WRAP(I)-CP. But (33a) does not violate WRAP(I)-EPV and it is predicted that the resulting configuration is grammatical. That is because both the subordinate and the superordinate verbs are contained in the same intonational phrase as their respective extended projections.

3.6 Further remarks on the prosody of dislocates

As mentioned, dislocates form their own intonational phrases:

(39) a. $(_I$ CLLD) $(_I$ FinP/Fin')

b. $(_I$ FinP) $(_I$ CLRD)

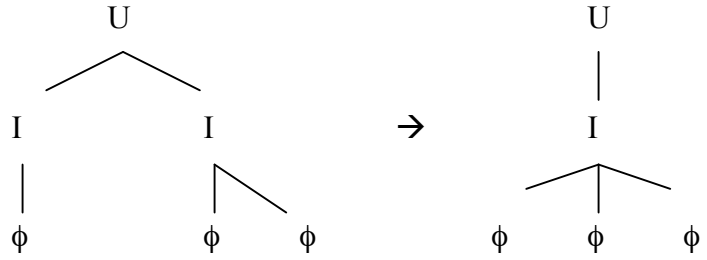
I take this to imply that the feature [+a] triggers obligatory intonational boundaries (under certain conditions, see the section on p-movement below). I express this by means of an ALIGN(I) constraint:

(40) ALIGN(I)-[+a]: Align (R,[+a]; R,I)

The right edge of a constituent bearing the [+a] feature is aligned with the right edge of an intonational phrase.

Let me elaborate on this a little further. Frascarelli shows that in rapid speech an intonational phrase that dominates a single phonological phrase is absorbed onto the adjacent intonational phrase. I call this phenomenon *fusion*:

(41)



The opposite phenomenon may also occur. In very deliberate speech – maybe, irritated speech – a speaker may place extra intonational boundaries (in apparent violation of WRAP(I)-EPV or WRAP(I)-CP). I call this *fission* of intonational phrases:

(42) (John's) (not) (here) (now)!!!

Given these facts, how can one say with any certainty that dislocated constituents form intonational phrases? There are three possibilities;

(i) There are several alternate ways to construct the prosody of a sentence.

(ii) Having [+a] fusioned to the intonational phrase of the clause is basic, fission is derived.

(iii) Having an intonational phrase for [+a] is basic, while fusion is derived.

(i) seems the least interesting possibility and I am not aware of any linguist adopting it. It makes the mapping from syntax to prosodic structure purely random and makes well-known constraints like Align or Wrap unformulable. (ii) has no takers either, as far as I know. According to (ii) we would start with an intonational phrase for the whole clause and the [+a] constituent is later detached. The problem of this is the following: the output of PL-computation is a linearized prosodic structure. There is no reason to assume that the feature [+a] is preserved, since this is not the kind of feature attached to prosodic units. If the feature [+a] is lost, fission of [+a] cannot take place.

Thus, I assume that (iii) is the most likely possibility. PL-computation reads the feature [+a] as an instruction to erect intonational boundaries. Fusion and fission are performance phenomena that take place at a later module and do not affect our current investigation. This is also what is assumed by Nespor and Vogel (1986) and Frascarelli (2000), although without the reasoning presented here.

4. WRAP(I)-EPV and LCA.

In section 4.1 I argue that right dislocation is the outcome of the conflicting requirements of WRAP(i)-EPV, Align-[+a] and the LCA, with the result that the latter loses. Section 4.2 explains that higher dislocates are linearized to the left because all constraints can be satisfied without conflict. 4.3 discusses some complex examples involving subordination. 4.4 argues that the high ranking of ALIGN is triggered by the presence of the clitic. 4.5 discusses remnant movement approaches to the problem of right dislocation.

4.1 Proposal

My account of why right dislocation exists, in spite of the LCA is simple. Take ALIGN(I)-[+a] to be a very high constraint (under certain conditions). If so, linearizing a [+a] constituent in Spec,v pits WRAP(I)-EPV against the LCA. If a [+a] constituent is left linearized, as required by the LCA, WRAP(I)-EPV ends up being violated because a [+a] constituent introduces a new intonational phrase and the extended projection of the verb ends up split in two intonational phrases, one containing V and v, another containing T and Fin. A ranking of both constraints favors WRAP(I)-EPV and left linearization of [+a] is thrown out. [+a] ends up being right linearized.

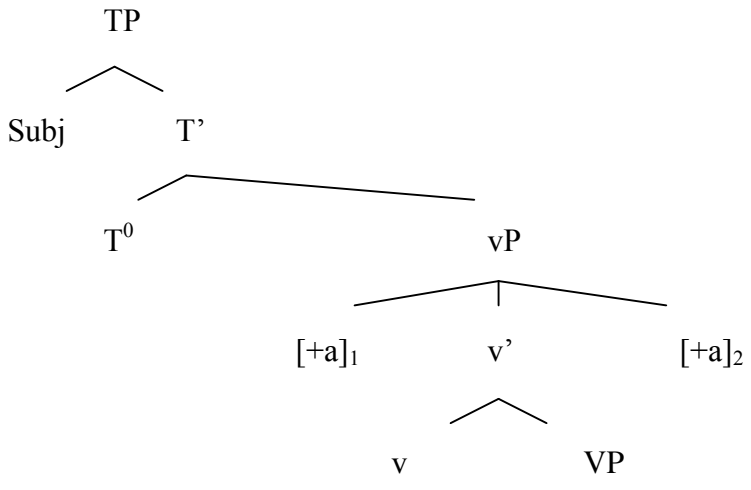
Let me articulate this step by step:

1. Merge and Move (internal and external Merge) build a CP.
2. PL-computation kicks in, following the binary procedures described above. I.e.: prosodic phrases and intonational phrases are built as we move from one word to the next, bottom-up. LIN constructs pairs xPy, yPx, immediately discarding the one that does not obey the LCA.
3. This goes on until we encounter the [+a] constituent in Spec,v. As we know, [+a] introduces a new intonational phrase (by ALIGN(I)-[+a]). As usual, LIN creates two linearization possibilities. [+a]Pv or vP[+a]. The LCA should force [+a]Pv because the spec c-commands the head but this creates a problem with WRAP(I)-EPV. Since [+a] introduces a new intonational phrase, the intonational phrase that contains the lexical verb closes with a left boundary without including T and Fin. The PL-computational system detects a violation of WRAP(I)-EPV at once.
5. Under the assumption that WRAP(I)-EPV is ranked higher than the LCA, the [+a] constituent is linearized to the right. The [+a] constituent can now close its left boundary.
6. PL-computation continues including T and Fin within the same intonational phrase that contains v and V.

(43) illustrates the situation I have just discussed. If an intonational phrase covers the whole FinP, ALIGN(I)-[+a] is violated (43.1). If [+a] introduces a new intonational phrase boundary, we have two choices. When PL-computation reaches the vP, it has to

linearize the [+a] constituent to the left or to the right. Left linearization violates WRAP(I)-EPV (43.2), while right linearization violates the LCA (43.3).

(43)



1.( ) → *violates ALIGN(I)-[+a]*
2.( ) ( ) ( ) → *violates WRAP(I)-EPV*
3.( )( ) → *violates LCA*

In (44) I use an optimality-style tableau to show once again how ALIGN(I)-[+a], WRAP(I)-EPV and LCA interact to determine the linearization of [+a] constituents. The input is a c-command configuration which must be linearized and prosodified. Rows 1-4 show the four possible outputs for PL-computation (commas indicate sequencing). Let's start with rows 3 and 4. The high ranking of ALIGN(I)-[+a] prevents building a whole intonational phrase for the whole sentence, including the [+a] constituent, as shown in row three. For completeness, the fourth row of the tableau shows that right linearizing a [+a] constituent that does not form its own intonational phrase gives rise to violations of ALIGN(I)-[+a] and the LCA. Taking ALIGN(I)-[+a] for granted, we can concentrate on the first two rows.

We see that LIN creates two candidates, one that linearizes the [+a] constituent to the left, the other to the right. Under the assumption that WRAP(I)-EPV is ranked higher than the LCA, the [+a] constituent is linearized to the right. The constraints ALIGN(I)-[+a] and WRAP(I)-EPV appear unordered (indicated with double vertical lines):

(44)

Input: [+a]Cv^0	*ALIGN(I)-[+a]*	*WRAP(I)-EPV*	*LCA*
1. ($_I$ [+a]), ($_I$ v^0 VP)	√	*	√
2. ($_I$ v^0 VP), ($_I$ [+a])	√	√	*
3. ($_I$ …[+a]…)	*	√	√
4. ($_I$ ……), [+a]	*	√	*

4.2 CLLD

As discussed above, [+a] constituents which are also [+c] are displaced to a high position between Fin and Force:

(45) El reloj, no lo quiso comprar.
the watch NEG CL.ACC want.PAST.3SG buy.INF
'He/she did not want to buy the watch.'

The high position of CLLD is the crucial difference between CLLD and CLRD because the CLLDed constituent is outside the extended projection of the lexical verb. Thus, the dislocated constituent can be left linearized while respecting WRAP(I)-EPV.

The analysis is presented again in the form of a tableau in (46) (from which I omit ALIGN(I)-[+a] for simplicity). The input is the c-command configuration involving the displaced [+a] constituent and the clausal head Fin. Left linearization allows us to respect WRAP(I)-EPV and the LCA and is therefore the one chosen.

(46)

Input: [+a]CFin^0	*WRAP(I)-EPV*	*LCA*
1. **($_I$ [+a]), ($_I$ Fin^0 T^0 v^0 VP)**	√	√
2. ($_I$ Fin^0 subj T^0 v^0 VP), ($_I$ [+a])	√	*

Left dislocated constituents can also appear in a subordinate clause:

(47) Juan dijo que los libros los repartiría mañana.
Juan say.PAST.3SG that the books CL.ACC deliver.COND tomorrow
'Juan said that he would deliver the books tomorrow.'

As mentioned (see section 2), I take it that CLLD sits somewhere between Fin and Force, possibly in the spec of an intermediate TopP or as a spec of Fin. As for prosody, Feldhausen's (2006) field-work on Catalan shows that the dislocated constituent builds an intonational phrase with the previous material. The corresponding prosodic structure is in (48b):

(48) C a. El Joan va dir [$_{\text{ForceP}}$ [$_{\text{Force}}$ que] els llibres Fin els
the Joan PAST.3SG say.INF that the books CL.ACC
lliuraria demà]]]
deliver.COND tomorrow
'Juan said that he would deliver the books tomorrow.'

b. ($_{\text{IntP}}$ El Joan va dir que els llibres) ($_{\text{IntP}}$ els lliuraria demà)

This intonational structure is expected within my assumptions:

1. Build subordinate CP.
2. PL-computation. ALIGN(I)-[+a] erects a new intonational boundary. The CLLDed constituent is linearized to the left, respecting both WRAP(I)-EPV and LCA.
3. With the [+a] constituent a new intonational phrase begins. Notice that this new intonational phrase includes the whole extended projection of the matrix verb and therefore satisfies WRAP(I)-EPV.[14]

4.3 More complex cases

In this section I consider three more cases involving subordination. Since the discussion yields simple solutions to fairly complex data, the model proposed here is shown to be robust.

When a constituent in the matrix clause is CLRDed, it appears at the end of the entire utterance, following the subordinate CP;

(49) Yo le dije que vendría Juan, a Susana.
I CL.DAT said.PAST.1SG that come.COND Juan DAT Susana
'I told Susana that Juan would come.'

This follows from the model presented in these pages. First, *a Susana* is a [+a] constituent sitting in Spec,v and erecting an intonational boundary. *le dije que vendría Juan* forms one I-phrase. The NTC forces *a Susana* to attach to the left or the right boundaries of this prosodic constituent. As argued, WRAP(I)-EPV forces the [+a] constituent to attach to the far right.

Interestingly, if the subordinate clause includes a CLLDed constituent, the matrix CLRD also goes to the far end:

(50) Juan le dijo que los libros, los compraría mañana, a Susana.
Juan CL.DAT said that the books CL.ACC buy.COND tomorrow DAT Susana
'Juan told Susana that he would buy the books tomorrow.'

The question now is why *a Susana* cannot be embedded between the two intonational phrases:

(51) a. ($_I$ Juan le dijo que los libros)($_I$ los compraría mañana)($_I$ a Susana)
b. *($_I$ Juan le dijo que los libros) ($_I$ a Susana)($_I$ los compraría mañana)

The answer comes for free under the assumption that NTC applies to all units of prosodic structure, including the Utterance. The two intonational phrases form an utterance [$_{U}$($_{I}$ … le dijo que los libros)($_{I}$ los compraría mañana)]. According to the description provided in section 3.3, two or more I-phrases form an Utterance if they are in an asymmetric relation such that one is "stronger" than the other(s). In examples with CLLD it is clear that the two I-phrases form one utterance, with the nuclear stress falling on the right-most I-phrase. Utterances, just like intonational phrases and prosodic phrases, can only be extended at the edges. Thus, the new intonational phrase can be linearized at the beginning or at the end of the utterance. The result is (50b).[15]

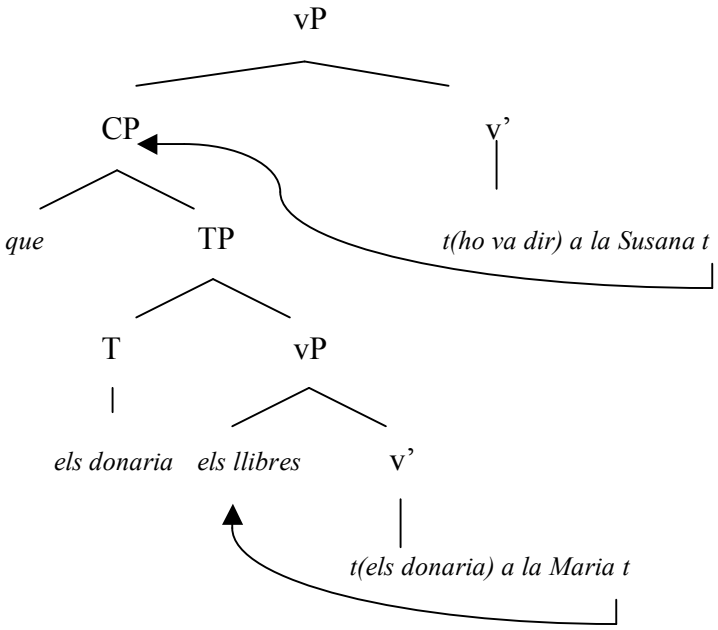
Villalba (p.c.) points out that it is possible to right dislocate a constituent out of another right dislocated constituent. When that is the case, the order is not free but rigid: first we find the bigger constituent, then the subextracted one:

(52) C a. El Joan ho va dir a la Susana ,
The Joan CL PAST.3SG say.INF DAT the Susana
que els donaria demà a la Maria, els llibres.
that CL.ACC give.COND.3SG tomorrow DAT the Maria the books
'Joan said to Susana that he would give the books to Maria tomorrow.'

b. *El Joan ho va dir a la Susana, els llibres, que els donaria demà a la Maria.'

Within the framework developed in this article, this restriction follows directly. Consider the structure in (53):

(53)



The matrix vP has the subordinate clause in its spec. The subordinate vP also has a constituent in its spec, the DO *els llibres*.

The PL-computation algorithm presented in sections 3.3 and 3.4 builds linearized prosodic structures out of syntactic relations of dominance and c-command. I further set up the system to go from the bottom up, right to left. We can assume that PL-computation begins either after every syntactic operation, after a phase is built or after a CP is built. In any case, the subordinate CP is linearized before it merges with the matrix CP. This means that the subordinate CP already has its complement linearized as a right dislocation at the point it merges with the matrix verb. Subsequently, the subordinate CP

– including its dislocated object - is moved to Spec,v and erects an intonational boundary, by virtue of ALIGN(I)-[+a]. Thus, the entire CP must be right linearized, and the word order can only be as shown in (52a).

An anonymous reviewer points out a derivation that would yield (52a) without violating any of the constraints proposed in this article. This derivation would involve raising the complement of the subordinate clause to the spec of the matrix v independently of CP movement:

(54) 1. que els portaria els llibres demà. →obj raises to Spec,v
that CL.ACC bring.COND the books tomorrow

2. que [$_{vP}$ els llibres$_i$ els portaria t_i demà] →obj raises to Spec,C

3. que els llibres$_i$ Fin [$_{vP}$ t_i els portaria t_i demà] → further merge

4. El Joan ho va dir a la Susana → obj raises to Spec,v
the Joan CL PAST.3SG say.INF DAT the Susana
que els llibres$_i$ Fin [$_{vP}$ t_i els portaria t_i demà]
that the books CL.ACC bring.COND morning

5. El Joan [$_{vP}$ els llibres$_i$ ho va dir a la Susana que t_i Fin
els portaria t_i demá →CP raises to Spec,v

6. El Joan [$_{vP}$ els llibres$_i$ [$_{v'}$ [que t_i els portaría t_i demá]$_j$
[$_{v'}$ ho va dir a la Susana t_j]]]

The only wrong step in this scenario is step (54.5): CLRD is clause-bound (as demonstrated by Cecchetto 1999 and Villalba 2000) and step 5 can never take place.[16]

4.4 Further remarks on the ranking of ALIGN(I)-[+a]

At the beginning of section 4.1 I claimed that the ALIGN(I)-[+a] constraint is ranked very high "under certain conditions". Why this qualification? Because there is a class of [+a] constituents in Spanish that move to a mid-field position but are not dislocated. (55) is an example:

(55) a. Ayer compró Ana el libro.
Yesterday buy.PAST.3SG Ana the book
b. Ayer compró el libro Ana t.

The difference between (55a) and (55b) involves the information structure: (55a) is an all-focus, presentational sentence. In (55b) there is narrow focus on *Ana*, while *el libro* is [+a]. According to Zubizarreta's (1998) influential analysis, the grammar of Spanish includes an instance of displacement that she calls "prosodically motivated movement", or *p-movement* for short. In (55b) the direct object would have p-moved to the left of the subject. Ordóñez (1998) shows that the object raises to a position from where it can c-command the post-verbal subject:

(56) Este libro se lo regaló a cada niño su amigo.
this book CL.DAT CL.ACC give.PAST.3SG DAT each boy his friend
'His friend gave this book to each boy.'
Ordóñez 1998: 319

Updating Ordóñez (1998) proposals, I take it that p-movement targets Spec,v:

(57) Ayer compró [$_{vP}$ el libro [$_{v'}$ Ana t(v) [$_{VP}$ t(V) t(el libro)]]]

Thus, p-moved and CLRDed constituents seem to occupy the same position. The fact that [+a] constituents in Spanish do not need to dislocate entails that ALIGN(I)-[+a] is a constraint whose ranking may vary. An inspection of the data quickly reveals that what correlates with rightward linearization is the presence of the clitic (for dialects without clitic doubling of direct objects). Thus, I claim that the presence of the clitic in the input triggers the high positioning of ALIGN(I)-[+a]:

(58) Input: [+a]Cv^{o} → LCA >> ALIGN(I)-[+a]
Input: [+a]Cv$^{o}_{cl}$ → ALIGN(I)-[+a] >> LCA

In a similar vein, Kallulli (2006) argues that clitics in Albanian bear prosodic features that are responsible for the deaccenting of given constituents in this language.

But I am not aware of any analysis that links the presence of a functional item in the input to a ranking of constraints.

Linguists working within the Optimality framework routinely attribute language variation to different rankings of the same constraints, without discussing where the different rankings come from. One plausible hypothesis, which would merge the hypotheses of Borer (1984) with Optimality Theory, is that the presence of certain features on functional categories in the input gives rise to minimal but empirically visible lowering or lifting of constraints in the hierarchy. For instance, take Samek-Lodovici's (2005) analysis of word order in Italian and English. The facts are well-known: Italian allows for post-verbal subjects in contexts in which English does not allow them. The cross-linguistic difference, natural enough, is attributed to a low ranking of the EPP in Italian. It is also natural to claim that the low ranking of the EPP in Italian is triggered by the agreement morphology on T. The issues are complex and I can't address them within the confines of this article, I would simply like to point them out hoping that future research will clarify them.

4.5 Alternatives

Earlier approaches to CLRD are purely syntactic and include the following two ingredients: (i) the [+a] constituent moves to the left and (ii) the other constituents move even further to the left: the right position of dislocates would be the outcome of an instance of *remnant movement*. This family of analyses shares the implicit assumption that syntax takes place in a two-dimensional computational space where notions such as

"left" or "right" are relevant. As stated, I do not make such an assumption: syntax is organized around hierarchical notions and order becomes an issue in the mapping from syntax to PF.

There has been intensive research on remnant movement since Kayne (1994) – see for instance Kayne (1998) and Müller (1998) and much later work – and the body of data and analyses is at this point quite considerable. Thus, I am not able in this section to provide anything like a comprehensive overview of the issues. Instead, I limit myself to a few words on remnant movement as has been applied to CLRD, pointing out what I perceive to be some problems in the approach.

Cecchetto (1999) proposes that each constituent moves for independent reasons leaving the dislocated constituent stranded on the right as a by-product of these independent movements. He further adopts the Big DP hypothesis, according to which the dislocated constituent and the clitic are initially merged as one constituent.

With the help of (59), let's see how Cecchetto's analysis works. The end point of the derivation is the sentence that appears at the top, with the direct object dislocated and the subject in sentence final position receiving narrow non-contrastive focus. (59) could answer the question: 'Who saw the movie?'.

The starting point of the derivation is (59.1). The clause structure includes a Topic and a Focus Phrase, as well as an AgrOP. Note that the Focus Phrase is for regular information focus, not for contrastive or exhaustive focus. The subject is merged in Spec,v while the EPP position is taken by a null expletive *pro*. The object and the clitic are merged forming one constituent, a "Big DP". In (59.2) the big DP has moved to

Spec,AgrOP. In (59.3) *la película* has moved to Spec,Top, stranding the clitic. In (59.4) the subject has moved to Spec,Foc. Finally, in (59.5) the verb and the clitic attach to T (I am only assuming that the clitic would attach to T, Cecchetto is not explicit on this):

(59) La vio Juan, la película.
CL.ACC see.PAST.3SG Juan the movie
'JOHN saw the movie.'

1. [$_{TP}$ *pro* T Foc Top AgrO [$_{vP}$ Juan vio [$_{DP}$ la [$_{DP}$ la pelicula]]]]
2. [$_{TP}$ *pro* T Foc Top [$_{AgrOP}$ [$_{DP}$ la [$_{DP}$ la pelicula]] AgrO [$_{vP}$ Juan vio t]]]
3. [$_{TP}$ *pro* T Foc [$_{TopP}$ [$_{DP}$ la pelicula] Top [$_{AgrOP}$ [$_{DP}$ la t] AgrO [$_{vP}$ Juan vio t]]]
4. [$_{TP}$ *pro* T [$_{FocP}$ Juan Foc [$_{TopP}$ [$_{DP}$ la pelicula] Top [$_{AgrOP}$ [$_{DP}$ la t] AgrO [$_{vP}$ t vio t]]]
5. [$_{TP}$ *pro* T+la+vio [$_{FocP}$ Juan Foc [$_{TopP}$ [$_{DP}$ la pelicula]Top [$_{AgrOP}$ [$_{DP}$ t t] AgrO [$_{vP}$ t t t]]]

One could raise some technical questions with respect to (59). For instance, although extraction out of definite DPs is generally ungrammatical, in step (59.3) it seems to raise no deviance. Further, it is not clear to me how exactly the clitic abandons a spec position to move head-to-head to T without violating the Condition on Extraction Domains: for comparison, recall that Baker (1988) extensively argues that noun incorporation never takes place from a spec position.

Moreover, piecemeal movement becomes even more unlikely with an example like (60):

(60) La vio tranquilamente Juan, la película.
CL.ACC see.PAST.3SG peacefully Juan the movie
'Joan saw the movie.'
'JUAN saw the movie peacefully.'

In order to derive this example Cecchetto-style one needs to find a way to move the adverb. But as is well-known, motivating adverb movement is a delicate matter. Unless an adverb is focus fronted or wh-moved, neither if which is the case here, adverbs are always assumed to remain in situ.

Other linguists propose remnant movement of an entire constituent in one shot. There are two variants of this approach. In the first variant, the CLRDed constituent moves to a Spec,Top located in the left periphery and the entire TP moves past it to a higher position (Frascarelli 2000, Samek-Lodovici 2006):

(61) Juan la vio, la película.
Juan CL.ACC saw the movie
1. Top [$_{TP}$ Juan la vio la película]
2. [$_{TopP}$ la película Top [$_{TP}$ Juan la vio t]
3. [$_{TP}$ Juan la vio t_j]$_i$ [$_{TopP}$ la película$_j$ Top t_i]

Frascarelli (2000: 161) further argues that when we have CLLD and CLRD in the clause, the base structure includes two TopicP, one for each dislocate. The higher TopP houses the topic that will eventually be dislocated to the right while the lower TopP houses the one that shows up left dislocated. Frascarelli's idea is that the lower TopP may undergo remnant movement with the rest of the clause while the higher TopP is stranded:

(62) A María, no se la des, la película.
DAT Maria NEG CL.DAT CL.ACC give.2SG the movie
'Don't give Mary the movie.'
1. [$_{TopP}$ la película Top [$_{TopP}$ a Maria Top no se la des]]
2. [$_{TopP}$ a Maria Top no se la des] [$_{TopP}$ la película Top t]

The stranded dislocate is what we refer to as CLRD, while the pied-piped one is CLLD. Notice that this analysis predicts that CLRD c-commands CLLD. As we saw in section 2, example (9), the opposite is the case.

A second version of the vP movement approach acknowledges that CLRD is in a mid-field position, so remnant movement of vP targets a position also in the mid-field. Thus Belletti (2004) and Villalba (2000) have CLRD move to the spec position of a Topic Phrase located right above the vP while the latter moves to a Spec,Foc position located between TP and the lower TopP – an architecture not very different from

Cecchetto's (Belletti additionally assumes a BigDP, which I skip here for simplicity). Notice again that this focus position is for plain, information focus:

(63) Juan la vio, la película.

Juan CL.ACC saw.3RD.SG the movie

1. Juan T Foc Top [$_{vP}$ la vio la película]
2. Juan T [$_{TopP}$ la película Top [$_{vP}$ la vio t]]
3. Juan T [$_{FocP}$ [$_{vP}$ la vio t_j]$_i$ Foc [$_{TopP}$ la película$_j$ Top t_i]]

Notice that this approach entails that the vP must be a focus in CLRD constructions. However, it is relatively easy to produce examples in which the vP is not a focus at all:

(64) [Context: So, you didn't send the package, did you?]

C -Sí, ya lo creo que lo envié, el paquete.

Yes indeed that CL.ACC sent.1SG the package

'I did indeed send the package.'

An additional technical problem for this approach is presented by verb movement. We know the Romance languages have v→T movement. But it is unclear how v, embedded in a spec position, can raise to T (again, a comparison with Baker's work on incorporation comes to mind).

Moreover, remnant movement to Spec,Foc gives rise to two types of objections. The first type involves the notion of "focus movement" itself. I align myself with a line of researchers that view information focus as the unmarked pragmatic value (see McNally 1998, among others). If information focus is really the unmarked situation, it is unclear why there should be a syntactic phrase and a syntactic operation to bring it about. Along these lines, recent work by Horvath (2005) suggests that there is no "focus movement", the latter always involves some additional feature (exhaustiveness, contrastiveness etc) and it is this additional feature the one that triggers movement. I believe this approach is in the right track and, moreover, should be regarded as the default assumption against which other analyses have to argue.

5. Multiple dislocates

5.1 Analysis

As mentioned, a clause can hold multiple dislocates, either to the right or to the left. Further, as argued by Villalba (2000), the first dislocate c-commands the second (in agreement with the predictions of the LCA). Here I show this with the classic quantifier-variable test:

(65) a. A cada niño, su libro, no se lo he querido enviar.
DAT each boy his book NEG CL.DAT CL.ACC have.1SG wanted send.INF
'I didn't want to send every boy his book.'

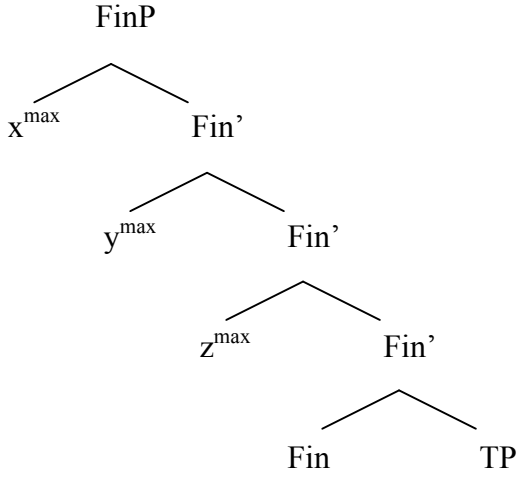
b. Cada libro, a su autor, no se lo he querido enviar.
Each book DAT its author NEG CL.DAT CL.ACC have.1SG wanted send.INF
'I will not deliver each book to his owner.' (bound reading √)

c. Su libro, a cada autor, no se lo he querido enviar. (bound reading *)

d. A su autor, cada libro, no se lo he querido enviar. (bound reading *)

I propose that a multiple specifiers solution paired with the simple approach to structure and c-command argued for in section 3.1 yields these data. If c-command is a configuration among sisters, as in the Reinhart tradition, then multiple dislocates stand in an asymmetric c-command configuration and can be linearized following the LCA. Consider the structure in (66), where I take dislocates to be specs of the same head, say Fin:

(66)



With the first branching node approach to c-command, x^{max} c-commands y, y^{max} c-commands z and z^{max} c-commands C. But c-command relations do not go up, so y^{max} does not c-command x and so on. We obtain the precedence relations xPy, yPz and zPFin, as desired.

Keeping this in mind, let's now take a look at multiple right dislocation, which will give us further insight into the PL-computation mechanisms presented above. (67) exemplifies multiple right dislocation. Again the order of the constituents is free:

(67) [Do you think that Joan will bring the books to Mary?]

a. Sí. Yo creo que los traerá, Juan, los libros.
   Yes. I think that CL.ACC bring.FUT.3SG Juan the books
   'Yes. I think Juan will bring the books.'

b. Sí. Yo creo que los traerá, los libros, Juan.

c. Sí. Yo creo que se los traerá, Juan, los libros, a María.

d. Sí. Yo creo que se los traerá, Juan, a María, los libros.

e. Sí. Yo creo que se los traerá, los libros, Juan, a María.

f. Sí. Yo creo que se los traerá, los libros, a María, Juan.

g. Sí. Yo creo que se los traerá, a María, Juan, los libros.

As was the case with CLLD, the first constituent c-commands the second:

(68) a. Juan se lo dará, cada libro, a su autor.
Juan CL.DAT CL.ACC give.FUT.3SG each book DAT its author
'Joan will give every book to its author.'

b. Juan se lo dará, a su autor, cada libro. (bound reading ??)

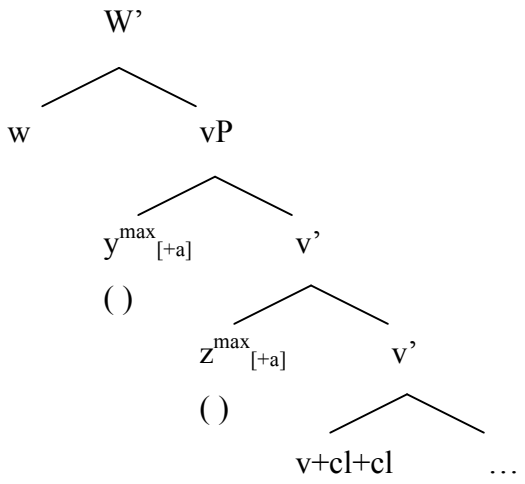
c. Juan se lo dará, su libro, a cada autor.
Juan CL.DAT CL.ACC give.FUT.3SG his book DAT each author
'Joan will give every author his book.' (bound reading ??)

d. Juan se lo dará, a cada autor, su libro.

This, of course, is the puzzle that I presented at the beginning of this article: the position of a CLRDed constituent with respect to the rest of the clause would suggest that the LCA should be abandoned but the hierarchical relations of the CLRDed constituents with one another suggest the opposite.

Let's see how my framework gives rise to the correct linearization. (69) shows the syntactic configuration arising from multiple displacement to Spec,v. y and z are [+a] constituents, specs of v, and w is the functional category selecting for vP:

(69)



In the tree we can see that the c-command relations are wCy, yCz, zCv. But the outcome that we want from PL-computation is the string w,v,…,y,z, not w,y,z,v.... This order is obligatory. Let's use the step by step procedure set up above.

First we have to linearize z and v. Since z^{max} introduces an intonational phrase boundary, WRAP(I)-EPV forces it to linearize to the right. The resulting string is: (v…), z:

1. LIN (z,v) → (v…)Pz (WRAP(I)-EPV)

Going up the tree, we have to linearize y and z. Notice that neither y nor z involves WRAP(I)-EPV. But the LCA is still active and the result is that y precedes z. This is how the first dislocate c-commands the second.

2. LIN (y,z) → yPz (LCA)

But now we have the terminals y and v that need to be linearized. This is because we have the ordering relations yPz and vPz but no ordering relation between y and v. So LIN applies once more, with the result that WRAP(I)-EPV forces y to be linearized to the right of v:

3.LIN (y,v) → vPy (WRAP(I)-EPV)

So we now have the ordering pairs vPy and yPz, which yield the following string: (v…), y, z.

Now is the turn to linearize the functional category w with the highest constituent so far, y. The LCA forces w to be linearized to the left of y:

4. LIN (w,y)→ wPy (LCA)

But now we need to linearize the terminals w and v, since both of them precede y. The LCA determines that w should precede v. The resulting string is now the following: w, (v…), y, z.

5. LIN (w,v) → wPv (LCA)

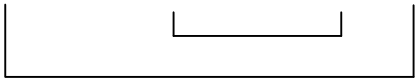
Thus, the PL-computation developed in section 3 successfully captures the c-command and linearization facts involved in multiple CLRD.

5.2 Alternatives

I finish this section with some words on previous attempts at reconciling multiple dislocation with the LCA. Again, I will not try to settle a complex issue in a few pages. Rather, I point out what seem to me to be points of difficulty in previous analyses.

Rizzi (1997) follows Kayne in assuming that every head can only have one adjunct/specifier. In order to account for multiple dislocation, Rizzi (1997) proposes that every CLLD (he does not mention CLRD) is in the spec of (or adjoined to) a Topic Phrase and that TopP can be iterated. Note that, since the order of dislocates is free, it follows that one can always construct a grammatical example that would entail a violation of minimality, regardless of the theory of VP structure one assumes:

(67) $[_{TopP}$ PP Top $[_{TopP}$ DP Top [… DP …PP]]]



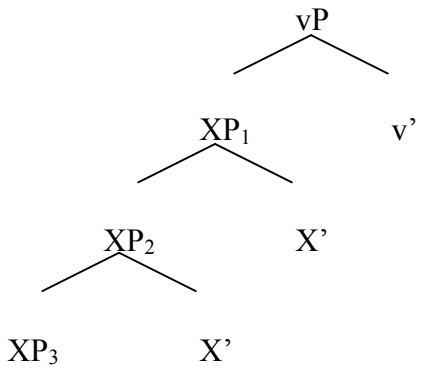
This problem does not arise in a multiple specifiers/adjuncts approach, under the reasonable assumption that constituents in the minimal domain of a head do not give rise to minimality violations for each other. As demonstrated above, a simpler definition of c-command allows us to maintain the spirit of the LCA.

Frascarelli (2000: 139-140) does propose a multiple adjunction solution. She is aware that this goes against Kayne's LCA, which she otherwise wishes to maintain. her solution goes as follows: first she claims that Kayne's ban against multiple specifiers only affects those specifiers that check features against a head, not those specifiers (or adjuncts) that do not check any features. Second, she claims that dislocates do not check features. Thus, since dislocates do not check features against a head, it is possible to have several of them.

However, it is unclear to me how this solves the linearization conflict that Kayne's theory leads to. Recall that the essence of Kayne's prohibition against multiple specifiers/adjuncts is that they c-command one another (given his definition of c-command and the segment-category distinction). Since multiple specifiers/adjuncts c-command one another, no ordering relation can be established among them and the derivation crashes. Frascarelli does not explain how absence of feature checking can affect a phrase structure configuration to the point that the c-command relations are altered. Additionally, Frascarelli does not explain how a set of non-feature-checking adjuncts are supposed to be linearized.

Finally, Villalba (2000) proposes that the multiple dislocates adjoin one another (in a manner reminiscent of Kayne's (1994) analysis of multiple clitics in Romance or Grewendorf's 2001 analysis of multiple wh-movement). The following tree adapts his analysis to my structural assumptions:

(68)



Multiple adjunction seems to me to be in the right track, but this particular structure presents an empirical problem. One can extract a constituent out of a CLRDed constituent, as shown by Villalba (2000) and López (2003):

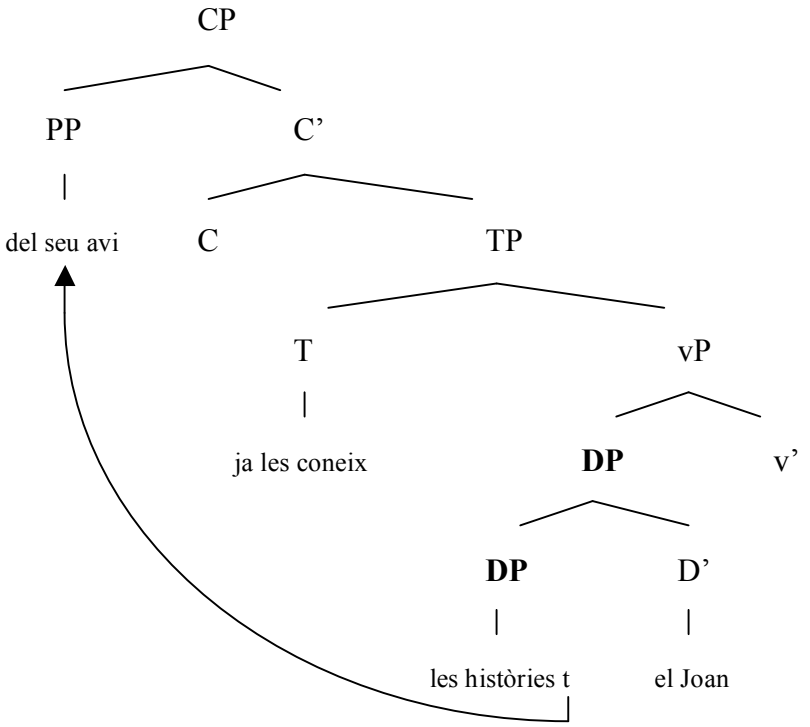
(69) C Del seu avi, el Joan ja les coneix, [les històries t].
Of-the his grandfather the Joan already CL.ACC know.3SG the stories
'Joan already knows all his grandfather's stories.'

If so, extraction out of XP_2 or XP_3 should give rise to a subjacency violation because two DP barriers would be crossed. But no subjacency violation occurs. Consider example (70):

(70) C Del seu avi, ja les coneix, les histories, el Joan.
Of-the his grandfather already CL.ACC know.3SG the stories the Joan

Within Villalba's assumptions, the structure of this example is as follows:

(71)



As indicated, *del seu avi* must cross two DP boundaries, which should give rise to a subjacency violation.

Conclusions

I have argued that the LCA is a soft constraint that is violated when it conflicts with the prosodic constraint WRAP(I)-EPV. As a result of this conflict, a constituent that forms its own intonational phrase in PL-computation and stands in the middle of a verbal extended projection must be right linearized. I have also argued that the constraint-defined LCA, together with a basic definition of c-command, can accommodate the fact that natural languages may have multiple dislocates and have provided an analysis of their hierarchical relations.

Along the way, I have touched upon some isues relevant for the syntax-phonology interface. I have shown that principles that have been posited for narrow syntax (the "edge feature", the NTC) can be useful to analyze prosodic computations. Prosodification and linearization have been shown to be simultaneous operations. Linearization is an algorithm that forms ordered pairs of terminals as input and chooses the optimal one as output.

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Spanish, French, Italian and Portuguese

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[1] Small case x,y,z represent terminals, capitalized X,Y,Z represent non-terminal nodes. I also use the following shortcuts occasionally:

xCy=x c-commands y

xPy=x precedes y (precedence is also occasionally indicated with a comma)

xDy=x dominates y

[2] If the complement of X does not branch, then we have mutual c-command between X and Y with the result that x and y cannot be ordered. Kayne addresses this issue by allowing for vacuous projection, so that Y always projects onto a YP. Chomsky (1995), which does not allow for vacuous projection, proposes that when two non-branching terminals are merged one must incorporate into the other.

[3] With the possible exception of wh-movement in ASL. Neidle et al (1997, 1998) argue that wh-movement in this language is rightward, while Petronio and Lillo-Martin (1997) argue that it is leftward.

[4] These examples include dislocated subjects. Subject dislocates are not doubled by a clitic, agreement on T being sufficient to license them. I do not discuss subject dislocation at any length in this paper, although its syntax is not substantially different from that of complement dislocates.

[5] Notice that the third person dative clitic in Spanish is *le* in isolation and *se* in combination with other clitics.

[6] Vallduví and Vilkuna (1998: 83): "if an expression a is contrastive, a membership set M={…,a,…} is generated and becomes available so semantic computations as some sort of quantificational domain."

[7] If there is no clitic, as in (i), the indirect object behaves like a PP and can never c-command the direct object (see Demonte 1995, Bleam 2004). Thus, ditransitives without a dative clitic do not allow us to detect whether dislocation affects structural relations.

(i) Maria dio un libro a Susana.
Maria gave a book to Susana

[8] The following examples show that floating quantifiers in Spanish appear in contexts of A-movement and not in contexts of A'-movement:

(i) Los hombres viajan todos en coche
The men travel.3rd.pl all by car
'The men travel all by car.'

(ii) *¿Quiénes viajan todos en coche?

Who.pl travel.3rd.pl all by car

(iii) *LOS HOMBRES viajan todos en coche.

the men travel.3rd.pl all by car

[9] Designing an algorithm that ensures that specs precede their complements has turned out to be a non-trivial enterprise. Uriagereka (1999) proposes that specs are actually big heads because at the point when they merge to the main derivation they are fully spelled-out and internally linearized. Thus, specs can be regarded as terminals that c-command the heads that select them. However, prosodic phonology reads specs as phonological phrases, not as phonological words. Moreover, as one reviewer points out, Uriagereka's system is designed to ensure that subjects are opaque for extraction, but it is questionable that this is a desirable empirical outcome (Stepanov 2001). Li's (2006:160) Modified LCA successfully derives that specs precede complements but it includes some concepts that can't be easily accommodated to my system.

[10] I ignore for my purposes units smaller than the word as well as the possibility of a finer grained intermediate level. See Selkirk (2005) for an overview.

[11] Kratzer and Selkirk (2007) propose to eliminate reference to XPs and replace it with Chomsky's notion of phases. Again, for our purposes we can stick to the traditional approach.

[12] Frascarelli (p.c.) tells me that in her own data a phrasing in which the CLLDed constituent is isolated within its own intonational phrase is more common in Italian, provided that the dislocate includes more than one phonological phrase. This does not affect my argument.

[13] Both consultants accepted or preferred to have both complementizers in Spanish:

(i) Sie sagen / they say *que los libros que los traen mañana*.

This fact does not lead to concluding that Force is part of the extended projection of the verb. Code switchers can but do not have to switch at every available boundary.

[14] If Frascarelli (p.c.) is right and CLLDed constituents also erect an intonational boundary to their left (see fn 13), all I need to do is add an extra Align constraint: ALIGN(I)-[+a]: Align (L,[+a]; L,I). My analysis is otherwise unaffected.

[15] As an anonymous reviewer points out, Nespor and Vogel (1986) argue that two utterances can fuse into one, with the result that two sentences end up included in one utterance:

(i) a. ($_U$ Los dos). ($_U$ dámelos)

b. ($_U$ Los dos. Dámelos) Nespor and Vogel (1986; 236)

'The two (of them). Give them to me.'

However, CLRD cannot cross sentential boundaries (Villalba 2000). I surmise that fusion of utterances, like fusion of intonational phrases, is a late performance phenomenon and, therefore, linearization of CLRD takes place over structures like (ia) and not like (ib). In my view, Nespor and Vogel 's description of semantic and pragmatic restrictions on utterance fusion provide support for the performance view on fusion.

[16] López (2003) argues that movement to Spec,v is A-movement while movement to Spec,Fin/Top is A'-movement. Therefore that CLRD outside the clause leads to a violation of the Proper Binding Condition.