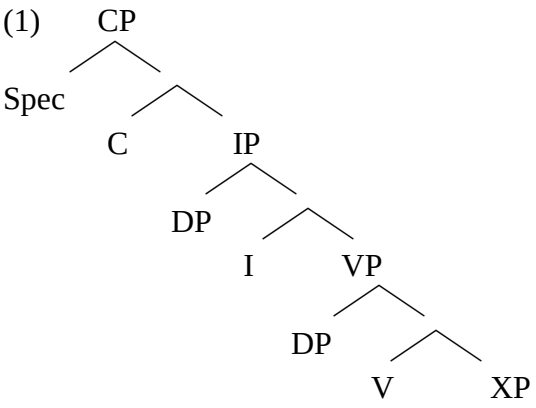
Luigi Rizzi **TG1**

Elements of the Cartography of Syntactic Structures

0. Introduction

A typical tree structure for the clause, as assumed around the mid-1980 (also assumed, with very few modifications, in much main-stream minimalist literature):

(1)



Three zones in the syntactic tree, specialized in the expression of different elements of meaning. There is a division of labor between the structural layers that form the clause: the VP layer expresses properties of **argumental semantics** (who does what to whom, the thematic roles); the IP system expresses properties expressed by verbal inflections in the Indoeauropean (and other) languages, properties of **modality-tense-aspect semantics**; the CP system expresses properties of **scope-discourse semantics:** illocutionary force, or clausal type (declarative, interrogative, exclamative, imperative, etc.), scope of operators, and discourse-related properties (topicality, focus,…).

(2) The splitting of the inflectional space, linked to a systematic syntacticisation of inflectional morphology and a new attention to adverb syntax (Pollock 1989 and much related work) determined a very fast growth of the assumed functional structure, leading to progressively more complex and richer representations.

(3) Cartographic studies identified the complexity of syntactic representations as an autonomous research topic: drawing maps as precise as possible of syntactic structures, and particularly of the functional structures, is an important endeavour worth pursuing on its own (Cinque & Rizzi 2010, Rizzi & Cinque 2016).

(4) The cartography of syntactic structures:
- each layer in (1) is an abbreviation for a much richer structural zone, involving a functional sequence, a sequence of elements drawn from the functional lexicon;
- the building block is always the same: a head projects into a phrase by taking complements and specifiers through recursive applications of the X-bar schema (or Merge);
- ... but the system of functional heads is much richer than previously thought. The functional lexicon is richer, and it gives rise to relatively stable functional sequences.

(5) The initial empirical core for the analysis of the left periphery came from the study of Italian, with extensions to other Romance and Germanic languages, but this line of research quickly proved of

general relevance, and was extended to other language families. On **Romance** see Rizzi (1997, 2000, 2004a-b), Belletti, (2004a-b, 2009), Poletto (2000), Laenzlinger (1998), Cinque (2002), Beninca' and Munaro (2008), and on **Germanic** Grewendorf (2002), Haegeman (2004), among many other references. See Roberts (2004) on **Celtic**, Krapova & Cinque (2008), Garzonio (2005) on **Slavic**, Puskas (2000) on **Finno-Ugric**, Shlonsky (1998), (2014) on **Semitic**, Frascarelli and Puglielli (2010) on **Cushitic**, Aboh (2004), Biloa (2012), Bassong (2014), Torrence (2012), Hager-Mboua (2014) on **African languages**, Durrleman (2008) on **Creole**, Jayaseelan (2008) on **Dravidian**, Tsai (2007, 2015), Paul (2005), (2014), Badan (2004), Badan Del Gobbo (2007), Si (2017) on **Chinese**, Endo (2008), Endo (2014), Saito (2010) on **Japanese**, Pearce (1999) on **Austronesian**, Speas & Tenny (2003) on **American Indian**, Legate 2002 on **Australian** aboriginal, Durrleman (2008) on **Creole** languages, Pfau and Aboh (2015) on **Sign Languages**. In addition, much research was produced in Romance and Germanic **dialectology** (e.g. Ledgeway 2003, Paoli 2007, Cruschina 2012, Grewendorf and Poletto 2009), and on **Classical languages and diachrony** (Salvi 2005, Danckaert 2012, Beninca' 2006, Franco 2009), etc.. The study of the **interfaces with sound and meaning** was also developed (Bocci 2013, Bianchi, Bocci, Cruschina 2016, etc.).
Volumes 1, 2, 3, 5, 7, 8, 9, 11 of the subseries "The Cartography of Syntactic Structures" of the Oxford Studies in Comparative Syntax are devoted in part, or entirely, to the cartography of the left periphery. See Cinque & Rizzi 2010, Shlonsky 2010, Rizzi 2013a, Rizzi & Cinque (2016) for general overviews. See the site of the SynCart project https://www.unige.ch/lettres/linguistique/syncart/home/

1. Splitting the IP

Pollock (1989): IP can be split into finer components, each of which corresponds to a particular morphosyntactic feature. This gives a more transparent morphological analysis, and creates space for locating adverbials, thus permitting a more principled approach to adverbial and verbal. In particular I can be split into T proper, the expression of tense, and Agr, the expression of agreement with the subject in person, number (and, in some languages, gender):

(2) a X ne X pas X complètement *comprendre* la théorie…
(to) not completely understand the theory…

b X ne X pas *comprendre* complètement X la théorie…
(to) not understand completely the theory…

c X Il ne *comprend* pas X complètement X la théorie
he understands not completely the theory

d Ne *comprend*-il X pas X complètement X la théorie?
Understands he not completely the theory?
(Pollock 1989)

(3) … Agr … T …. V … (Belletti 1990)

(4) njuchi zi -na -wa -lum -a alenje (Chicewa)
'bees AgrS-Past-AgrO-bite-ASP hunters'

(5) Parl-o parl-av-o parl-er-ò
Parl-i parl-av-i parl-er(a)-i
Parl-a parl-av-a parl-er-à

(6) Mirror Principle: the order of affixes in morphology reflects the order of syntactic heads and is the mirror image of it (the most internal affix is the lowest one in syntax) Baker (1988)

(7) … AgrS … T … AgrO … Asp …V

NB: AgrO never appears in the English verbal morphology. In Romance, it may appear as past participle agreement with the object, e.g., in clitic constructions:

(8)a Maria ha letto i libri
'Maria has read the the books'

b Maria li ha letti
'Maria them has read+AgrO

In formal French, agreement with the object takes place when the object is moved, e.g. in relatives:

(9)a J'ai repeint la chaise
'I have repainted the chair'

b Voilà la chaise que j'ai repeint*e* __
'Here is the chair that I have repainted(fs) __'

NB: certain dialectal varieties, e.g., Salentino, have participial agreement with the object also when the object is not cliticized:

(10) T' a lavate le mani (It: Ti sei lavato le mani)
'You to-yourself have washed(fp) the hands (Calabrese 1984, Loporcaro 1998)

2. Cinque (1999)

(11) Cinque (1999) Properties of

- modality (possibility, obligation,…),

- tense (present, past, future),

- mood (indicative, subjunctive; realis, irrealis,…),

- aspect (having to do with completion, duration, frequency of the event: perfect, progressive,…)

- voice (active, passive, middle,…)

may be expressed by different morphosyntactic means (adverbs, preverbal particles, affixes),

but they reflect a hierarchy which is fundamentally uniform across languages.

(16) Cinque (1999): Languages fundamentally use three devices to overtly express the functional structure of the clause:
- particles (autonomous words) like modal *will, can*, etc
- affixes (attracting the verb) like *-erà, -ato* in Italian
- adverbs in specifier position.
The three devices are distinct manifestations of the same underlying hierarchy.

EVIDENTIAL MOD > EPISTEMIC MOD

(17)a Evidently, he probably was caught
b * Probably, he evidently was caught

(18) Evidentemente, Gianni probabilmente ha deciso di partire
* Probabilmente, Gianni evidentemente ha deciso di partire

(19) Ku pwun-i caphi - si - ess-ess - keyss – sup – ti - kka ? (Korean)
'The person catchPASS AGR ANTPast EPIST AGR EVID Q
'Did you feel that he had been caught? Was it evident to you that it was possible that…
= evidently, he could have been caught"

(20) …. [Spec1 EVID …. [Spec2 EPIST …

HABITUAL ASP > FREQUENTATIVE ASP

(21)a John is usually often obliged to stay home (habitual > frequentative)
b * John is often usually obliged to stay home (frequentative > habitual)

(22)a Gianni abitualmente è spesso costretto a rimanere a casa
b * Gianni spesso è abitualmente costretto a rimanere a casa

(23)a Yareba (Papuan): yau - r - edib - eb - a - su
'sit CM FREQ HAB PRES 3ms' = he habitually repeatedly sits down
b Rapanui (Austronesian): Pura vara tu'u mai a Nau
'HAB FREQ come toward Pers. Sing Nau'

(24) …. [Spec1 HAB …. [Spec2 FREQ …

NB: Yareba also illustrates the ordering of affixes for aspect, tense, AgrS

(25) V+…Asp_{Freq}+Asp_{Hab}+T+AgrS

Which, under the mirror principle, illustrates the order of heads

(26) AgrS T … Asp Asp … V

3. Cinque's hierarchi of adverbials and functional heads

(29) Frankly > fortunately > allegedly > probably > once > then > perhaps > necessarily > possibly > willingly > inevitably > cleverly > usually> again > often > quickly > already > no longer > still > always > just > soon > briefly > characteristically > almost > completely > tutto > well > fast/early > completely > again > often

(30) [*Frankly* Mood$_{\text{speech act}}$ [*fortunately* Mood$_{\text{evaluative}}$ [*allegedly* Mood$_{\text{evidential}}$ [*probably* Mod$_{\text{epistemic}}$ [*once* T(Past) [*then* T(Future) [*perhaps* Mood$_{\text{irrealis}}$ [*necessarily* Mod$_{\text{necessity}}$ [*possibly* Mod$_{\text{possibility}}$ [*willingly* Mod$_{\text{volition}}$ [*inevitably* Mod$_{\text{obligation}}$ [*cleverly* Mod$_{\text{ability/permission}}$ [*usually* Asp$_{\text{habitual}}$ [*again* Asp$_{\text{repetitive(I)}}$ [*often* Asp$_{\text{frequentative(I)}}$ [*quickly* Asp$_{\text{celerative(I)}}$ [*already* T(Anterior) [*no longer* Asp$_{\text{terminative}}$ [*still* Asp$_{\text{continuative}}$ [*always* Asp$_{\text{perfect(?)}}$ [*just* Asp$_{\text{retrospective}}$ [*soon* Asp$_{\text{proximative}}$ [*briefly* Asp$_{\text{durative}}$ [*characteristically* (?) [? Asp$_{\text{generic/progressive}}$ [*almost* Asp$_{\text{prospective}}$ [*completely* Asp$_{\text{completive(I)}}$ [*tutto* Asp$_{\textit{PlCompletive}}$ [*well* Voice [*fast/early* Asp$_{\text{celerative(II)}}$ [*completely* Asp$_{\text{SgCompletive(II)}}$ [*again* Asp$_{\text{repetitive(II)}}$ [*often* Asp$_{\text{frequentative(II)}}$ …

(31) Da allora non hanno X_T di solito X_{Hab} mica X_{Neg} più X_{Term} sempre X_{Cont} completamente rimesso+X_{Compl} tutto *X_Q bene *X_{Voice} in ordine (Cinque 1999)

This system predicts that there are head positions in between adverbial positions, which can be used for V movement:

(14)a Jean a tout fait
b Gianni ha fatto tutto

(15)a Gianni ha fatto tutto bene
b Gianni ha fatto bene il lavoro

(16) … [… Agr … [tutto Asp [bene …
It Lgd Fr

(17)a Jean a tout bien rangé
b Gianni ha sistemato tutto bene

c1 Apo mandigadu bene (*bene mandigadu) Logudorese (Cinque 1999)
'I have eaten well'
c2 Apo tottu mandigadu (mandigadu tottu)
'I have eaten all'

4. Transitivity arguments for ordering

(18)a *Ils n'ont *pas plus* téléphoné
They haven't not any longer telephoned
b *Ils n'ont *plus pas* téléphoné
They haven't any longer not telephoned

It could be that *pas* and *plus* compete for the same position; or that the cooccurrence is prohibited for some other reason. In the latter case, transitivity arguments can give evidence on the underlying order:

(19)a Si tu n'as *pas déjà* mangé, tu peux le prendre
'If you have not already eaten, you can take it'
b * Si tu n'as *déjà pas* mangé, tu peux le prendre
'If you have already not eaten, you can take it'

(20)a A l'époque, il ne possédait *déjà plus* rien
'At the time, he did not possess already any longer anything'
b * A l'époque, il ne possédait *plus déjà* rien
'At the time, he did not possess any longer already anything'

Through transitivity, *pas* > *déjà*, *déjà* > *plus*, therefore *pas*>*plus*. Independent evidence:

(21)a *Ne dormir pas
b Ne pas dormir

(22)a Ne dormir plus
b Ne plus dormir

(23) [[pas [plus … dormir]]]

* OK

NB: this analysis requires that adverbials don't simply pile up as adjuncts to projections in a fixed order: they must be specifiers of functional heads, which may be the target of verb movement.

Independent comparative evidence from Italian:

(24)a Gianni non è mica più partito
'Gianni has not any longer left'
b * Gianni non è più mica partito
'Gianni has any longer not left'

Independent difference: both Italian and French are negative concord languages: multiple negative elements can coocccur with a single negative meaning

(25)a Non dirò niente a nessuno
I will not say anything to anyone

b Je ne dirai rien à personne

But in French, concord cannot include the clausal negation pas, whereas in Italian it can include the clausal negation non :

(26) * Je n'ai pas parlé à personne

Italian *Mica*, contrary to French *pas*, can cooccur with a negative element:

(27)a non ho mica visto nessuno
b * Je n'ai pas vu personne

So the cooccurrence constraint mica più is immediately observable in (24), whereas the ordering pas plus in French can be detected only indirectly, via a transitivity argument.

5. Reversals of ordering through movement

There are some apparent cases of cross-linguistic ordering discrepancies:

(28)a Gianni non vince *più sempre* le sue partite
G. [neg] win any longer always his games
b *Gianni non vince sempre più le sue partite

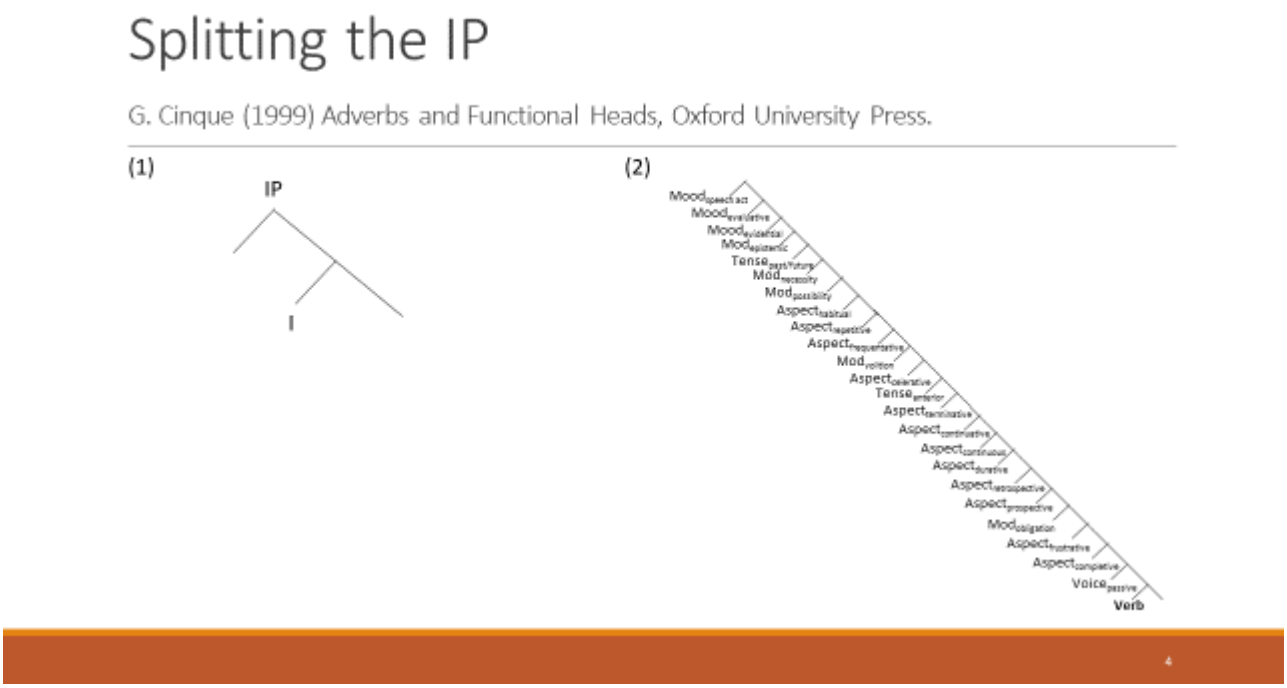
(29) John doesn't *always* win his games *any longer*

However, "when both a*lways* and *(not..) any longer* appear before the verb, their order is just like that found in Italian (Romance)" (Cinque (1999, 33):

(30)a John doesn't *any longer always* win his games
b *John doesn't *always any longer* win his games

The apparent ordering change in (28) can therefore be analysed as XP movement of *[always win his games]* across *any longer* as shown in (29). Movement across *any longer* gives rise to a slight focus on this adverb:

(31) John doesn't [*always* win his games]$_i$ *any longer* t$_i$



6. VP as vP+VP

(39) VP-internal subject hypothesis (Kuroda 1988, Koopman & Sportiche 1991)

(40)a Gianni ha visto Maria
b ___ ha [Gianni visto Maria]
c Gianni ha [___ visto Maria]

(41)a John will meet Mary
___ will [John meet Mary]
c John will [___ meet Mary]

(42)a [tutti [gli amici]] hanno [___ visto Maria]
b [gli amici] hanno [[tutti ___] visto Maria]

If the subject is merged in a predicate-internal position, and structures are binary, one needs more space within the predicate for tri-argumental verbs. This leads to a hierarchical analysis of the double object construction:

(43)a Bill gave John a book

b Bill showed [every boy] [his father]

c * Bill showed [his boy] [every father] (in the relevant interpretation: Barss & Lasnik 1988)

(44)a I showed Bill himself

b * I showed himself Bill

(45) [Bill [v [John [V a book]]]] (Larson 1988)

i.e., something like “Bill MADE John POSSESS a book”, “Bill MADE every boy SEE his father”

7. DP

(47) Una (altra) descrizione molto dettagliata della situazione
Une (autre) description très soignée de la situation
A(nother) very careful description of the situation

(48) [D [altra Num [molto dettagliata descrizione della situazione]]]

[D [other Num [very careful description of the situation]]]

(49) Greenberg (1963) Universal 20: “When any or all of the items (demonstrative, numeral, and descriptive adjective)precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite.” (p. 87)

(49) Cinque (2005), based on Greenberg’s (1963) Universal 20:

a Dem Num Adj N
These three nice books
(very common: Romance, Germanic,...)

b * Adj Num Dem N
Nice three these books
(Not attested)

c N Adj Num Dem
books nice three these
(very common: Cambodian,
Javanese, Thai, Gungbe,…)

d N Dem Num Adj
books these three nice
(rare: Kikuyu,…)

(50) [Dem [Num [Adj NP]]]

(51) Hypothesis: (50) is the initial order, and the engine to change the order is movement of the NP: if NP moves, it can take along other elements (pied-piping)

(52) Analysis:

- Nothing moves from (50): (49)a is derived;

- NP moves to the Spec of the next higher head (Adj), and then it pied-pipes the whole AdjP to the Spec of Num, etc. This produced the reversal of ordering (snowballing movement): (49)c.

- NP moves to Spec Adj, and continues to move Spec to Spec without pied-piping any constituent: (49)d.

- (49)b is not derivable: if NP does not move, no reordering is allowed.

A more fine-grained analysis:

(52) There are a priori 24 orders of the four elements (factorial 4): some are attested and frequent, some are attested and (very) rare, some are not attested:

a.	Dem Num A **N**	F
b.	Dem Num **N** A	F
c.	Dem **N** Num A	R
d.	**N** Dem Num A	R
e.	* Num Dem A N	*
f.	* Num Dem N A	*
g.	* Num N Dem A	*
h.	* N Num Dem A	*
i.	*A Dem Num N	*
j.	*A Dem N Num	*
k.	A N Dem Num	R
l.	N A Dem Num	R
m.	*Dem A Num N	*
n.	Dem A N Num	R
o.	Dem N A Num	F
p.	N Dem A Num	R
q.	*Num A Dem N	*
r.	Num A N Dem	R
s.	Num N A Dem	R
t.	N Num A Dem	R
u.	*A Num Dem N	*
v.	*A Num N Dem	*
w.	A N Num Dem	R
x.	N A Num Dem	F

(53) External Merge order:

Dem Num A N

(54) N (or NP) movement is the engine which determines variations from the external merge order: there is no other way to reorder elements.

(55) Then, Three movement options:

i. Movement with pied-piping of the *whose picture* type. This is unmarked: the Q feature is already on the Spec of the structure.

(56)a You saw [whose$_Q$ picture] → Internal Merge
b [Whose$_Q$ picture] did you see?

ii. Movement with pied-piping of the *Picture of whom* type. This is marked: the Q feature is expressed on a lower element, so some operation must apply to copy the feature on the head of the moved unit:

(57)a You saw [the picture of whom$_Q$] → Operation
b You saw [the$_Q$ picture of whom$_Q$] → Internal Merge
c ? [the$_Q$ picture of whom$_Q$] did you see ___?

iii. Movement without pied-piping. This is marked when the moved phrase is of the same kind as the phrase containing it, eg a nominal expression, as in whose picture, which requires pied-piping in languages like English (while other languages, e.g., Slavic, allow the splitting in such cases:

(58) a You saw [whose$_Q$ picture] → Internal Merge
b * Whose$_Q$ did you see [___ picture]

So the system offers a fine-grained analysis not only of the possible and impossible cases, but also of the more or less marked character of possible cases.