Avancées dans la formalisation de l'universalité des représentations linguistiques

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Structure of the talk

«Syntactic creativity» and the fundamental ingredients of syntactic computations.

The hierarchical nature of syntactic representations.

The cartography of syntactic structures.

Explanation of invariant and variable properties in cartographic maps.

A case study: Invariant and variable properties in topic and focus structures in the left periphery of the clause.

Syntactic «creativity»

- When we speak, we are constantly confronted with new sentences, sequences of words that we have not encountered in our previous linguistic experience...

- and still we find such new objects familiar: we constantly understand and produce new sentences.

- our capacity to create new sentences is unlimited.

Elements of syntactic computations

The human linguistic capacities can be modelled as the possession of a computing machine (Chomsky 1957), consisting of at least two kinds of entities:

- **Inventories**, lists of elements stored in memory (words,…)

- **Computational procedures**, putting together elements drawn from the inventories to form higher order units (phrases, sentences,…), recursive.

Alternatives to a computational approach?

Could it be that we just memorize fragments, sequences of words and retrieve and reuse them?

- No: we clearly have the capacity to go beyond what we hear and generate new structures.

Could it be that we create new sentences through analogical generalization from memorized fragments?

- The notion "analogical generalization" is insufficiently structured to make precise predictions. The point is that certain conceivable "analogical generalizations" are never explored by the language learner, whereas other "analogical generalizations" are systematically made. Why is it so?

Recent developments: **Inventories**

Inventories: shift of emphasis from the

contentive lexicon (N, V, A,…) to the

functional lexicon (D, Aux, C, T, Asp,…)

Functional elements:

- create configurational skeleta for the insertion of contentive elements; the functional structure give rise to complex configurations, studied in “cartographic” projects (Cinque & Rizzi 2010, Rizzi & Cinque 2016).
- trigger fundamental computational processes;
- express basic parameters of variation.

Elementary syntactic computations

Any syntactic theory aiming at empirical adequacy must be able to perform at least two kinds of computations:

1. **Structure building**: the construction of hierarchical structures through a recursive device.
2. The **expression of dependencies** between positions (the core case is the dependency between a phrase and a gap), and the operative **locality** principles.

Moreover, the system must be able to express **invariance** and **variation** in syntactic computations.

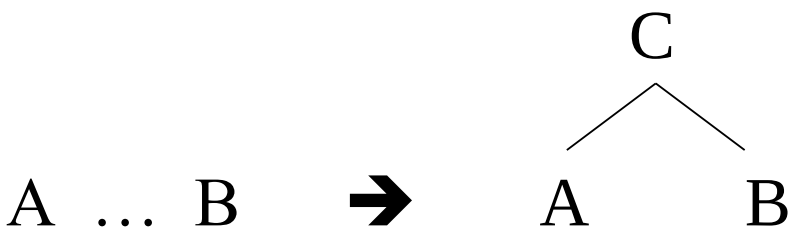
Recent developments: elementary computations

Computations: shift from concrete, construction-oriented rules (for relatives, questions, passives,…) to more abstract computational ingredients:

- Merge
- Search
- Spell-out

….

Recursive structure building: Merge

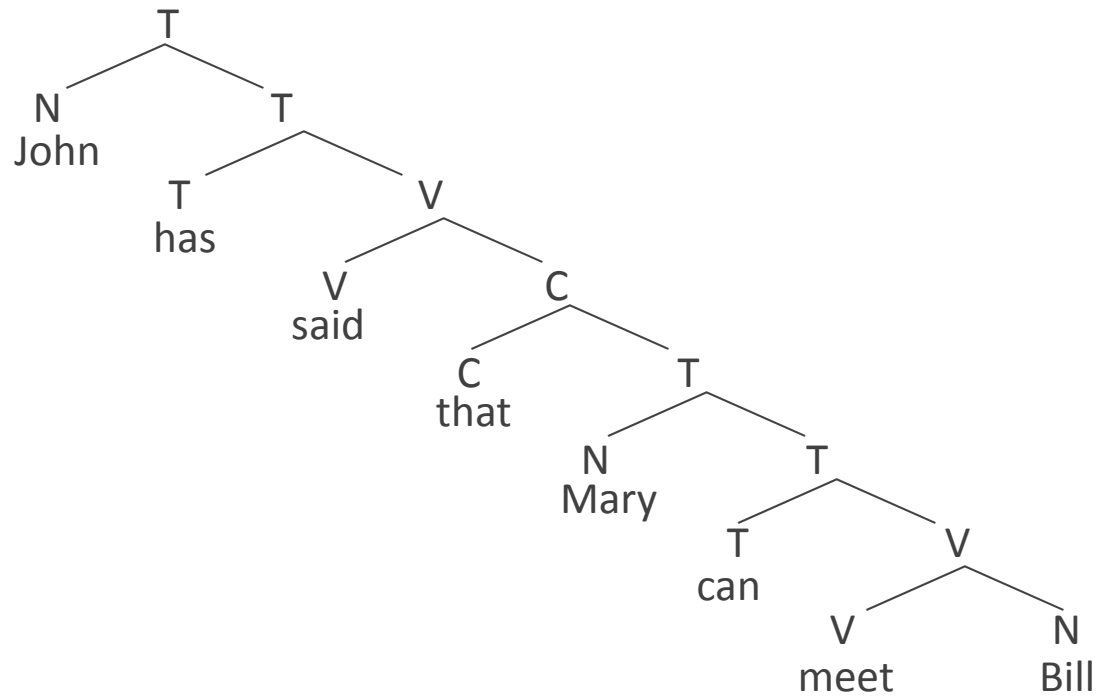


C = A, or C = B

On Merge: Chomsky 1995 and much subsequent work.
On labeling: Chomsky 2013, Rizzi 2015, Cecchetto & Donati 2015.

An example:

(3)



The creation of dependencies: movement

Certain elements are interpreted in a position different from the position in which they are pronounced:

(1)a Which book did John read __?

b Which book do you think [John read __]

c Which book do you think [Mary said [John read __]]]

Traditionally, these long distance dependencies were generated by a movement transformation, a device formally distinct from the fundamental structure building mechanism.

BUT this raised the issue of structure preservation. Movement is STRUCTURE PRESERVING (J. Emonds); but then, why should two independent rule systems converge in generating the same kinds of structures?

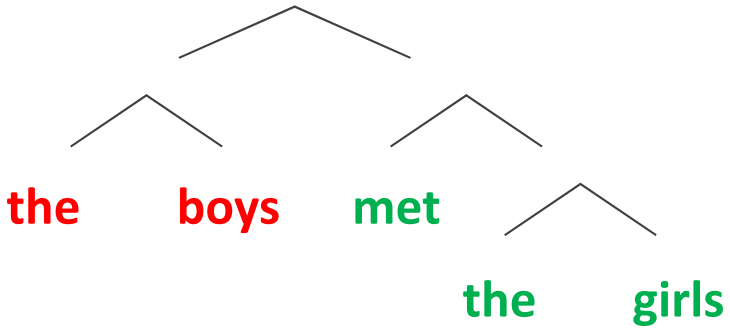
External and internal merge

The two elements A and B that undergo merge may be independent (**external merge**)

(1)

➔

(2)



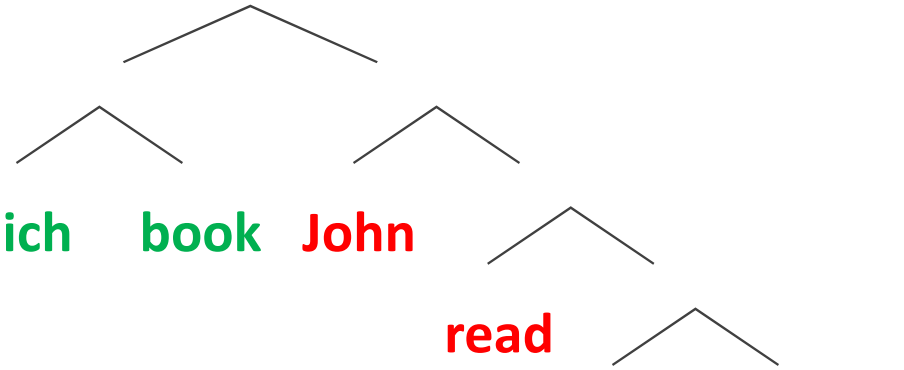
External and internal merge

Or one element can come from within the other (**internal merge**)

(3) **John**

read

which **book**



In this approach, structure preservation is expected because movement is a particular case of the fundamental structure building procedure, merge.

The role of hierarchical structures: Locality on movement is computed hierarchically

(1)a I think [John left at five]

b When do you think [John left ___]?

(2)A I wonder [who left at five]

b * When do you wonder [who left ___]?

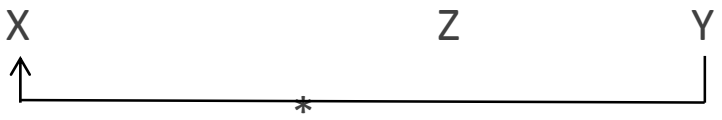
Relativized Minimality: X and Y cannot be related if there is a Z which intervenes between X and Y, and Z is an element of the same type as X. (Rizzi 1990, 2004, 2013)

(3) … X … Z … Y …

Locality is computed on hierarchical representations

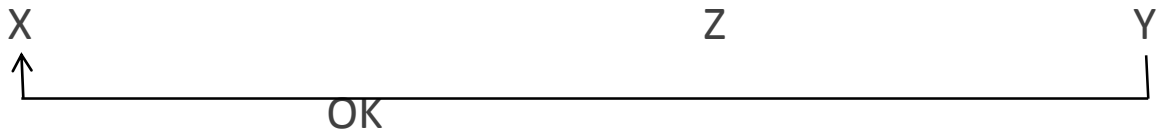
(3) You wonder [who left **at five**]

(4) ***When** do you wonder [**who** left ___]



(5) [The uncertainty [about [who won]]] dissolved **at five**

(6) **When** did [the uncertainty [about [**who** won]]] dissolve ___ ?

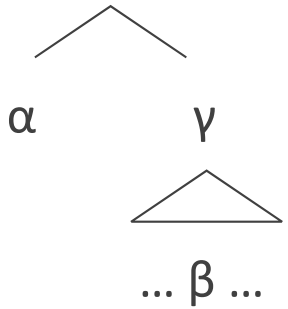


“Intervene” and C-command

(1) Z intervenes between X and Y iff Z c-commands Y and Z does not c-command X

(Rizzi 1990, 2004)

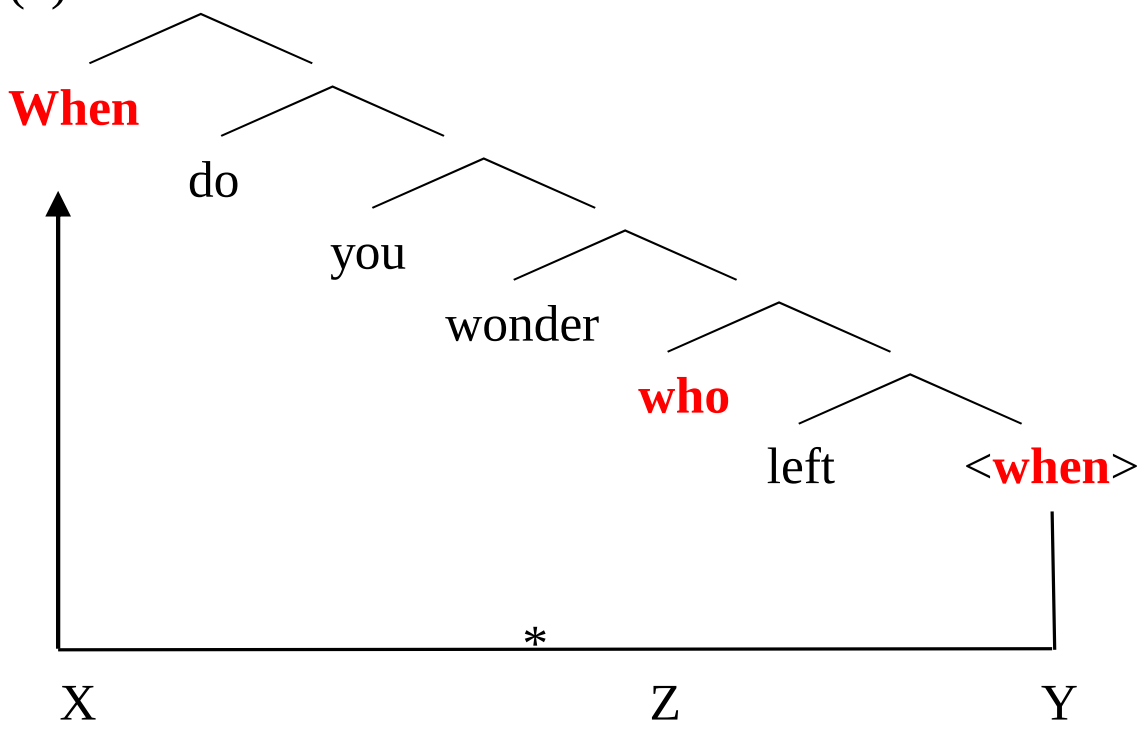
(2) C-command: α c-commands β in this configurations:



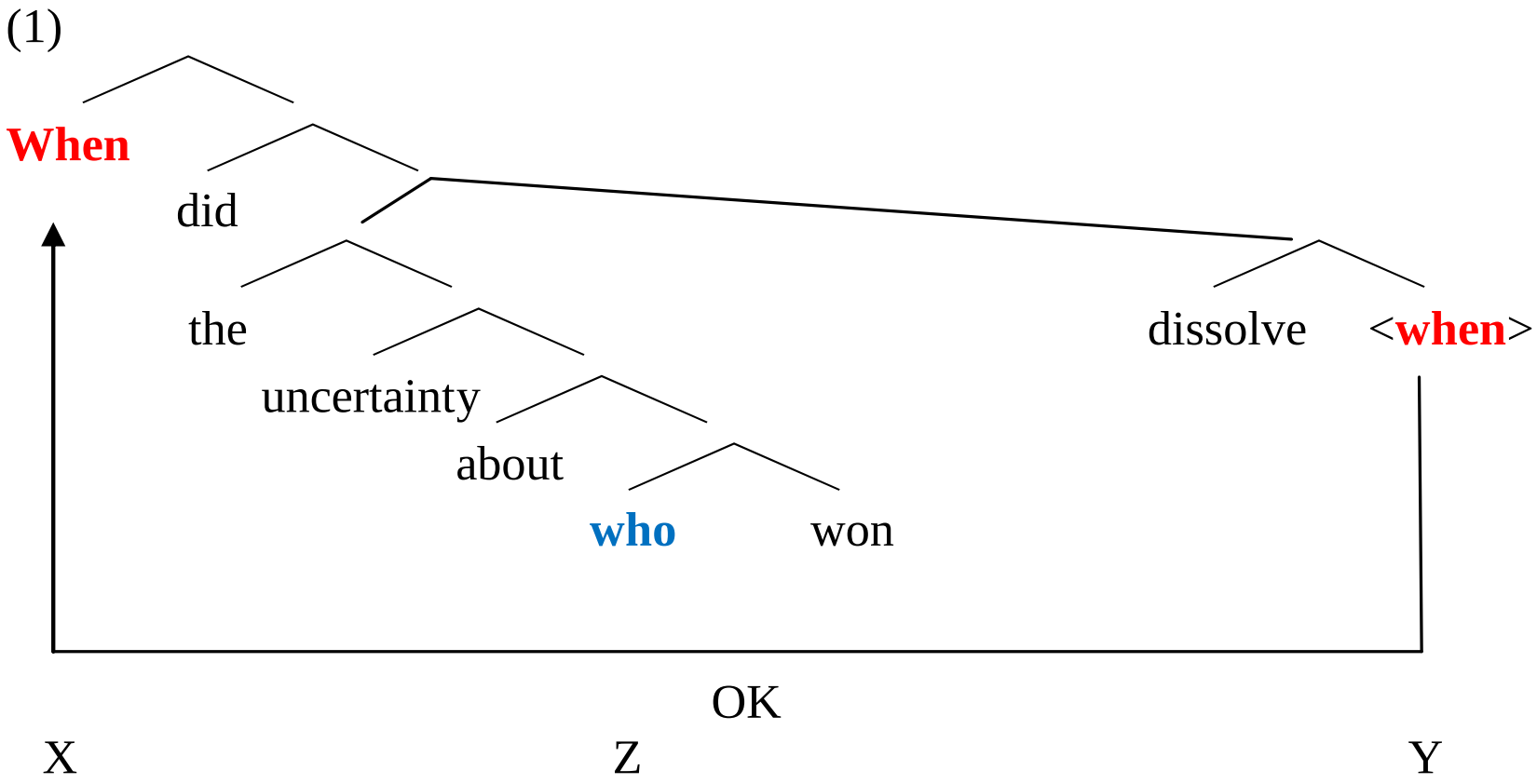
(Reinhart 1976)

The tree representation: hierarchical intervention

(1)



The tree representation: purely linear intervention



The cartography of syntactic structures

Ever since Chomsky (1957), the study of natural language syntax is centered around «structures», hierarchical representations generated by formal rules.

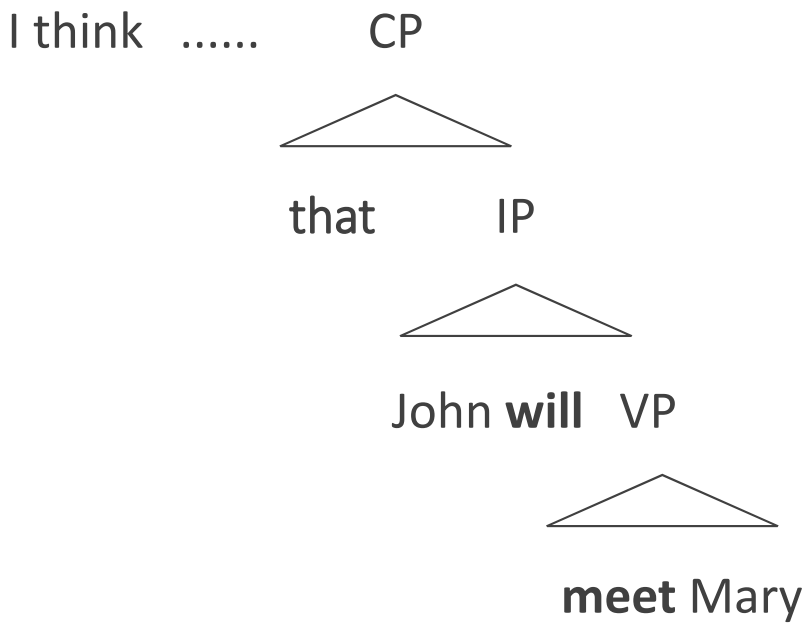
Syntactic structures are complex objects. Cartography is a line of research dedicated to highlighting their internal articulation, fine details, and properties.

This study can be conducted by drawing structural maps, as precise as possible, of the various zones of sentences and phrases.

What has emerged from the cartographic magnifier is that each structural zone consists of a sequence of functional heads which are associated to each lexical head and its projection.

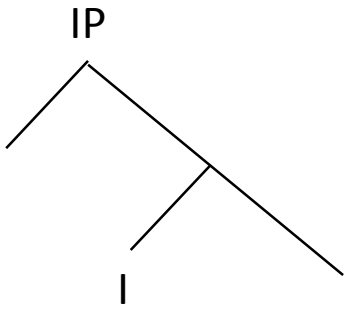
(Rizzi 1997, Cinque 1999, Rizzi & Cinque 2016)

Three layers in classical clausal representations



Split-IP G. Cinque (1999) Adverbs and Functional Heads, Oxford University Press.

(1)



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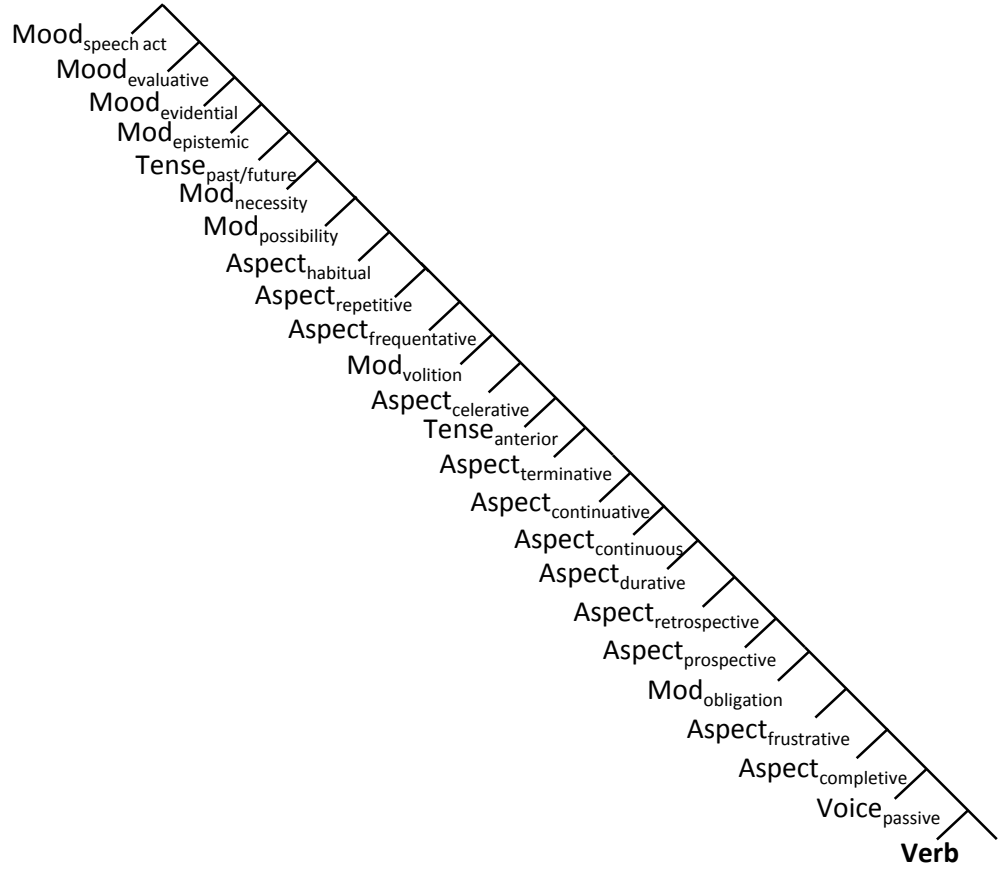
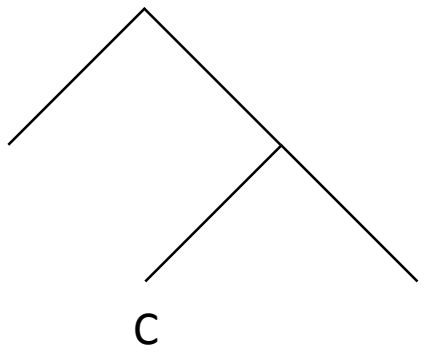


Split-CP L. Rizzi (1997) The fine structure of the left periphery, in L. Haegeman, ed.

(1)



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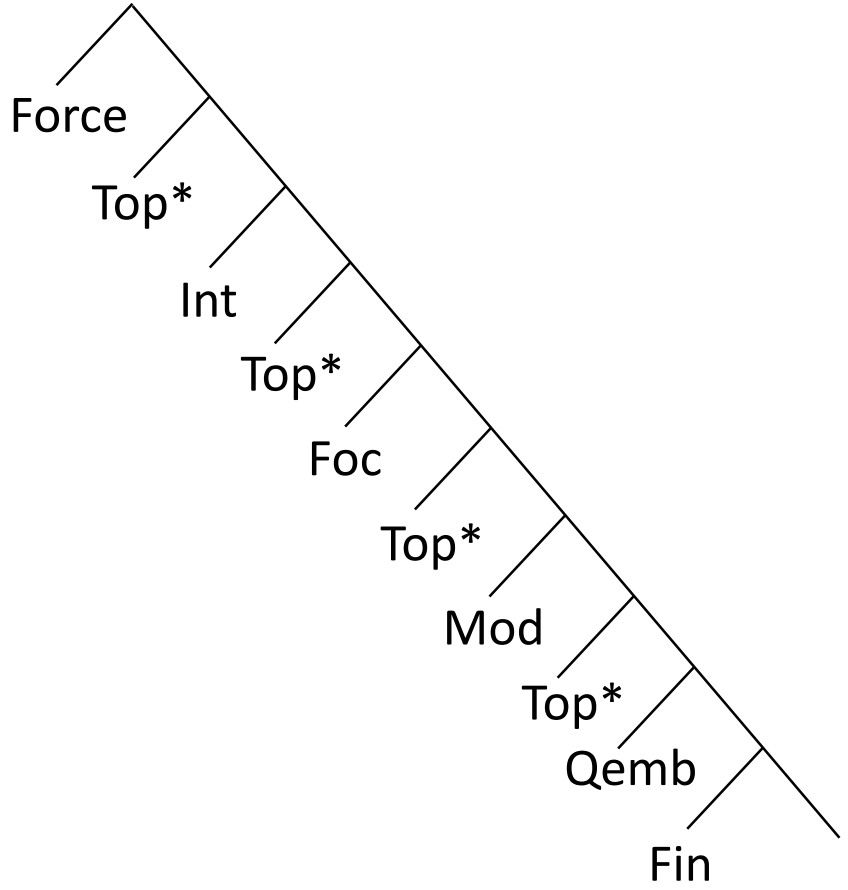


Cross-linguistic impact of cartographic studies

Cartographic studies initially focused on the maps of certain structural zones of the tree in **Romance** and **Germanic**: Rizzi (1997, 2000, 2004a-b), Belletti, (2004a-b, 2009), Poletto (2000), Laenzlinger (2002), Cinque (1999, 2002), Beninca' and Munaro (2008) on Romance, and Grewendorf (2002), Haegeman (2012) on Germanic; but quickly extended beyond the initial nucleus: Roberts (2004) on **Celtic**, Krapova & Cinque (2004) on **Slavic**, Puskas (2000) on **Finno-Ugric**, Shlonsky (1998) on **Semitic**, Frascarelli and Puglielli (2010) on **Cushitic**, Aboh (2004), Biloa (2012), Bassong (2012), Torrence (2012) on **African languages**, Jayaseelan (2008) on **Dravidian**, Tsai (2007), 2015, Paul (2005), Pan 2015, Si (2017) on **Chinese**, Endo (2008), Saito (2012) on **Japanese**, Pearce (1999) on **Austronesian**, Speas & Tenny (2003), Nevins & Seki (2017) on **American Indian**, Legate (2002, 2008) on **Australian,** Durrleman (2008) on **Creole,** Pfau and Aboh (2012) on different **Sign Languages**; in addition to much work in **Romance and Germanic dialectology** (e.g. Poletto 2000, Beninca' 2004, Cruschina 2012, Manzini & Savoia 2005, Di Domenico 2012, etc.), and on **Classical** languages and diachrony (Salvi 2005, Danckaert 2012, Beninca' 2006, Franco 2010), etc.

See volumes 1-11 of the OUP series The Cartography of Syntactic Structures, and Cinque & Rizzi 2010, Shlonsky 2010, Rizzi & Cinque 2016 for general overviews. See also the site of the ERC project SynCart http://www.unige.ch/lettres/linguistique/syncart/home/

Types of complementizers

Functional elements introducing embedded clauses are traditionally analyzed as complementizers occupying the same C position:

(1) Credo **che** partirò

'I believe that I will leave'

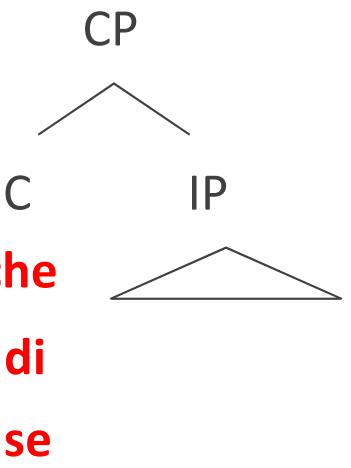
(2) Ho deciso **di** partire

'I decided to leave'

(3) Non so **se** partirò

'I don't know if I will leave'

(4)



Ordering of the sequence: Force – Int – Fin

But different kinds of complementizers **che, di, se** are ordered differently with respect to Topics:

(1) Credo **che** **il tuo libro**, lo leggerò domani **che > Top**
'I believe that your book I it-will read tomorrow'

(2) Ho deciso, **il tuo libro**, **di** leggerlo domani **Top > di**
'I decided your book, to read-it tomorrow'

(3) Non so, **il tuo libro**, **se** **a Gianni**, glielo leggerò domani **Top > se > Top**
'I don't know your book if to Gianni I to-him-it will read tomorrow'

(4) ... Force ... Top ... Int ... Top ... Fin ...
che **se** **di**

In some languages, such elements can co-occur in the same structure

"Reported questions" in Spanish and Japanese:

(1) María preguntó **que** **el lunes** **si** había periódicos

'Maria asked that the Monday if there were newspapers'

(Spanish: Plann 1982)

(2) Taroo-wa Ziroo-ni [CP dare-ga kare-no ie-ni kuru **no** **ka** **to**] tazuneta

T.-TOP Z.-DAT who-NOM he-GEN house-to come *no* *ka* *to* asked

'Taroo asked Ziroo *that* who is coming to his house'

(Japanese: Saito 2012)

Invariance and variation: mirror image of the complementizer sequence in Romance and Japanese

Romance (Rizzi 1997, 2013):

[Force/Report [Int [Fin [$_{IP}$ …] …] …] …]

che **se** **di**

Japanese (Saito 2012):

[… [… [… [$_{IP}$ …] Fin] Int] Force/Report]

no **ka** **to**

The criterial approach to scope-discourse semantics

The left periphery is populated by a system of functional heads (Q, Top, Foc,…) which attract phrases with matching features:

(1)a Which book should you read __ ?

b This book, you should read __ tomorrow

c THIS BOOK you should read __ (, not that one)

(2)a Which book **Q** should you read __ ?

b This book, **Top** you should read __ tomorrow

c THIS BOOK **Foc** you should read __ (, not that one)

Languages which overtly express Criterial heads

(5)a Ik weet niet [wie ***of*** [Jan ___ gezien heeft]] (Dutch varieties, Haegeman 1994)
'I know not who **Q** Jan seen has'

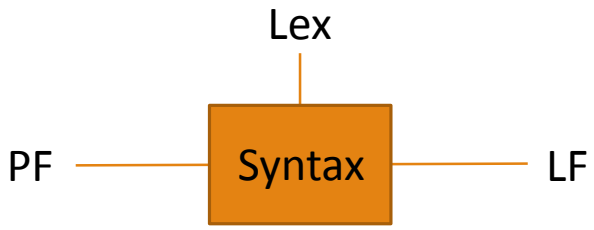
b Un sè [do [dan lo ***yà*** [Kofi hu ì]]] (Gungbe, Aboh 2004)
'I heard that snake the **Top** Kofi killed it'

c Un sè [do [dan lo ***wè*** [Kofi hu ___]]] (Gungbe, Aboh 2004)
'I heard that snake the **Foc** Kofi killed '

Role of criterial heads Top, Foc, Q, etc.

Functional heads such as Top, Foc, Q, etc. have syntactic and interface functions.

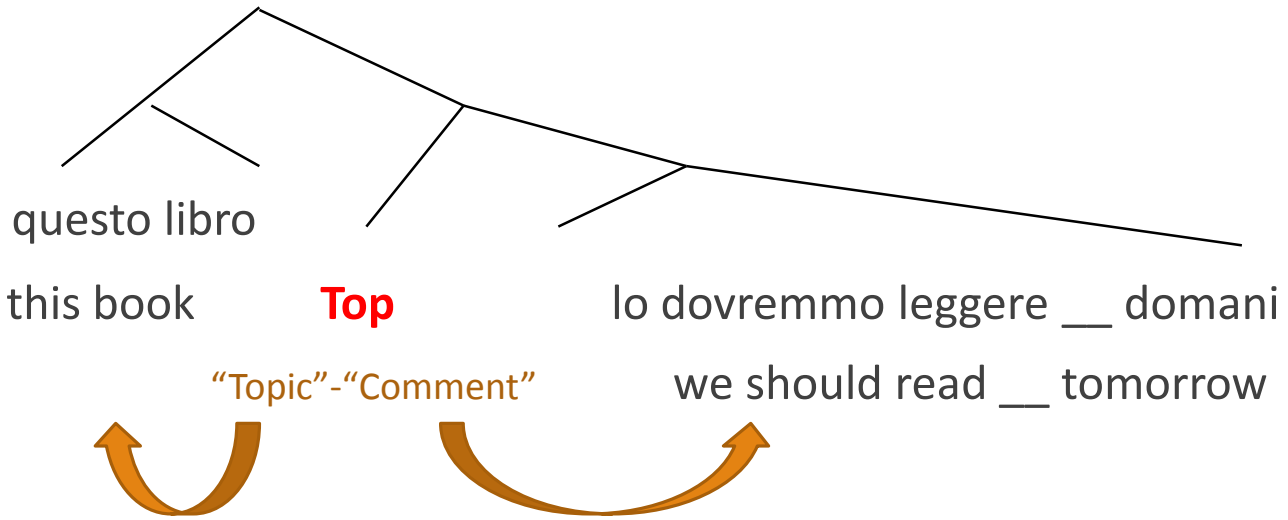
- In syntax: they trigger movement.
- At LF: they give interpretive instructions which determine conditions for felicitous use.
- At PF: they give instructions for assignment of prosodic contour.



On special prosodic properties of Top e Foc in Italian: Bocci (2013), Bianchi, Bocci, Cruschina (2016), etc. On Q: Marotta (2001), etc.

On the “syntacticization” of semantics-pragmatics of scope-discourse: Topic - Comment

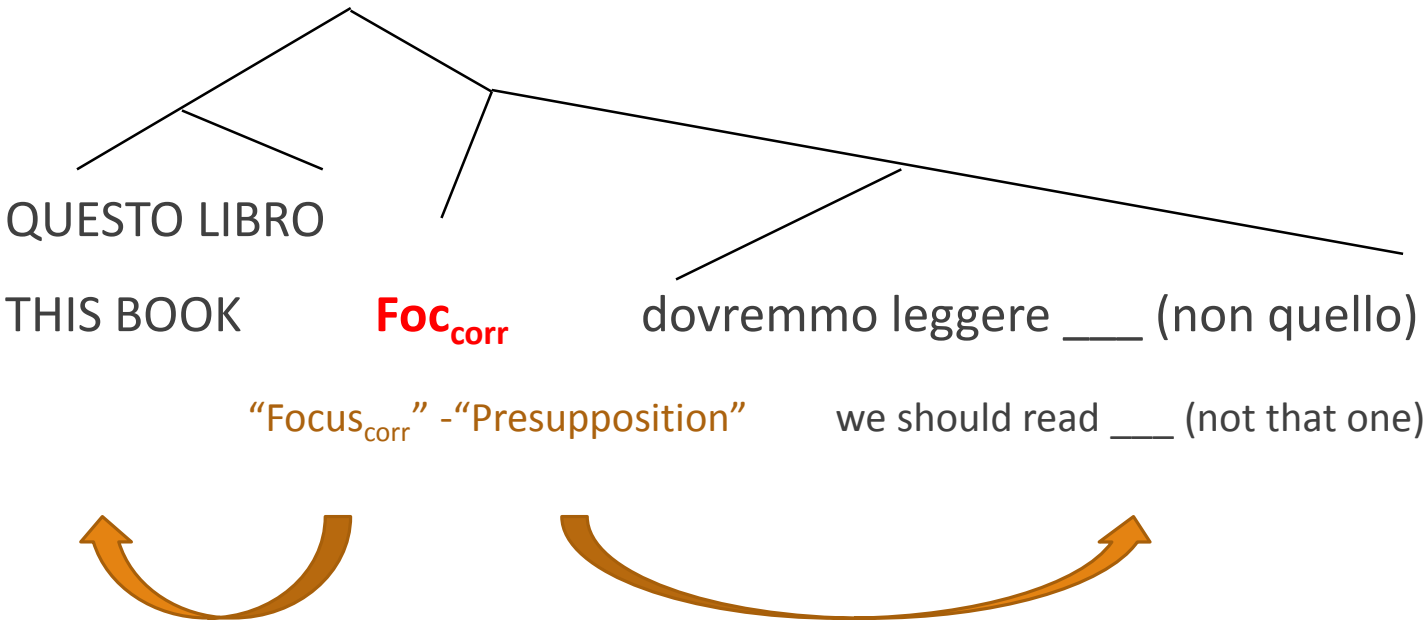
- The configurations created by merge and move are interpreted at the LF interface following the instructions associated to the criterial heads (Cinque & Rizzi 2010). E.g., for topics,



For a typology of topics: Bianchi e Frascarelli (2011), Frascarelli and Hinterhoelzl (2007).

On the "syntacticization" of semantics-pragmatics of scope-discourse: Focus – Presupposition

NB: on the different types of peripheral focus: Belletti 2009, Bianchi, Bocci & Cruschina (2016)

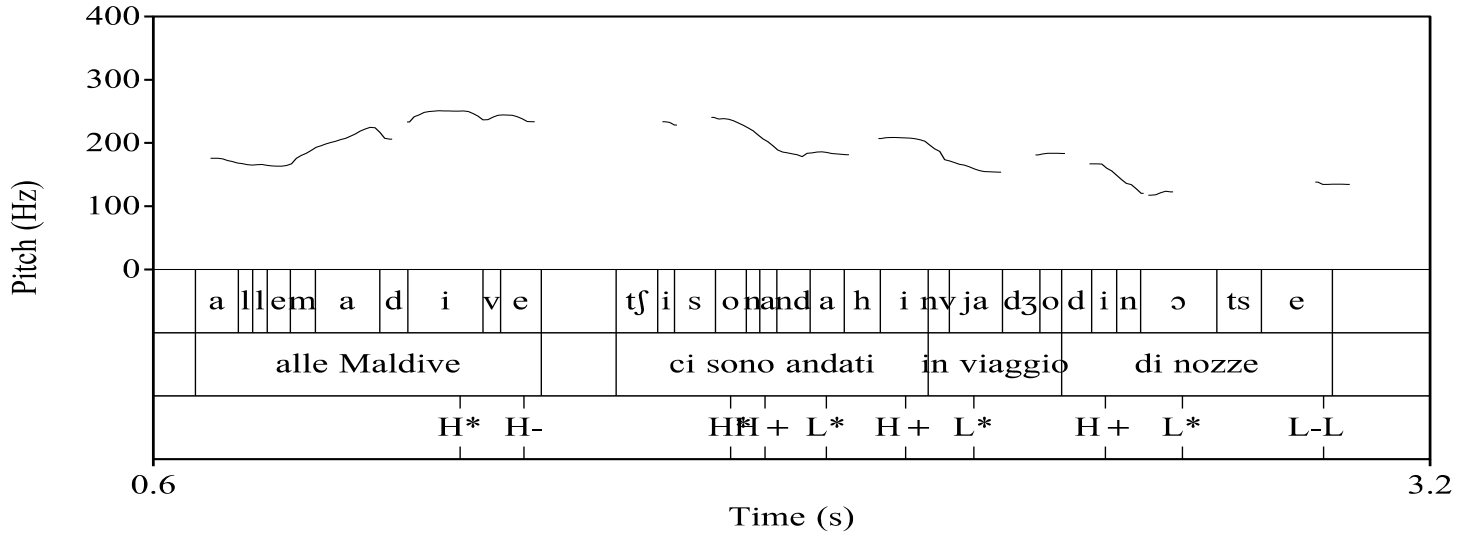


Topic-comment: prosodic properties (Italian)

Bianchi, Bocci, Cruschina (2016) 'Focus fronting, unexpectedness, and evaluative implicatures. *Semantics and Pragmatics.* Vol. 9.

(1) A: Secondo me non avranno mai il coraggio di partire da soli per le Maldive...
'According to me, they will never have the courage of traveling alone to the Maldives…'

B: Beh, alle Maldive, ci sono andati in viaggio di nozze.
'Well, to the Maldives, they went (there) on honeymoon.'

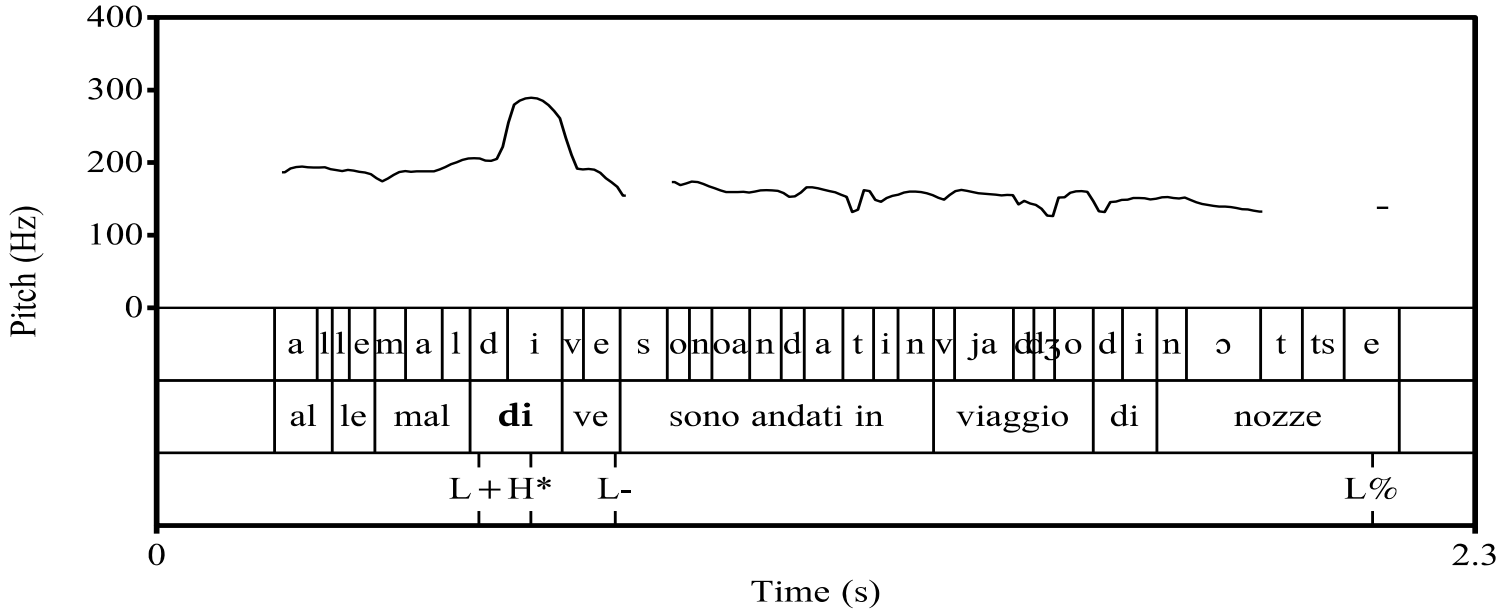


$\text{Focus}_{\text{corrective}}$ – Presupposition (Italian)

Bianchi, Bocci, Cruschina (2016) 'Focus fronting, unexpectedness, and evaluative implicatures. *Semantics and Pragmatics.* Vol. 9.

(2) A: Se ho capito bene, sono andati alle isole Vergini.
'If I understood correctly, they went to the Virgin Islands.'

B: Ti sbagli! ALLE MALDIVE sono andati in viaggio di nozze!
'You are wrong! TO THE MALDIVES they went on honeymoon!'



Cartography and explanation

Cartographic studies involve a large descriptive endeavour, which discovers numerous properties of functional systems: **order** of positions, mutual **incompatibility**, **freezing** effects, etc. Some such properties are invariant, other properties are variable.

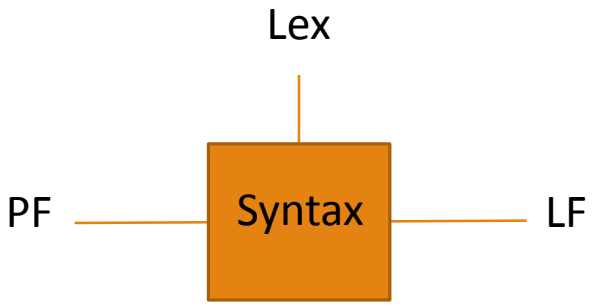
It is unlikely that such complex properties may be primitive entities of the human language faculty. How can they be deduced from fundamental ingredients of linguistic computations?

The search for deeper explanations of cartographic properties may thus become a powerful generator of empirical problems, which can nourish fundamental theoretical research in syntax, and enrich the empirical basis of syntactic theory.

Where to look for forms of "further explanation"

Given the fundamental architecture of the grammatical system, "further explanations" of cartographic properties may come:

1. From principles which constrain the interface systems (interpretive procedures, etc.);
2. From principles which constrain formal syntax (locality, labeling, etc.)



A fundamental difference between Topic and LP Focus

Many languages admit **multiple Topics** in the left periphery (either a language admits a single topic, or a potentially unlimited number of topics)

Languages typically admit a **single Focus** in the left periphery.

Multiple Topics

(1) ITALIAN:

A Maria, il tuo libro, glielo devi dare al più presto

‘To Maria, your book, you it-to him should give as soon as possible’

(2) ABIDJI

kòfí **ɛ́kɛ́** òkókò ɛ́ **ɛ́kɛ́** è pìpjé nì.

Kofi TOP banana DEF TOP ASPpeel RES PRON

‘Kofi, the banana, he peeled it.’

A single focus in the left periphery

(1) ABIDJI Topic

kòfí **ɛ́kɛ́** òkókò ɛ́ **ɛ́kɛ́** è pìpjé nì.

Kofi TOP banana DEF TOP ASP.peel. RES PRON

‘Kofi, the banana, he peeled it.’

(2) ABIDJI Focus

*kòfí$_j$ **bɛ́** òkókò ɛ́ **bɛ́** è pìpjé

kofi Foc banana Def. Foc ASP.peel.

‘KOFI THE BANANA peeled’ (Hager-Mboua 2014)

Uniqueness of corrective focus in the left periphery

(1)A: So che quest'anno Piero ha vinto le olimpiadi...

'I know that this year Piero won the Olympics...'

B: * Ti sbagli: quest'anno, GIANNI, I MONDIALI ha vinto, non Piero, le olimpiadi

'You are wrong: this year, GIANNI, THE WORLD CHAMPIONSHIP won, not Piero, the Olympics

B': Ti sbagli: quest'anno, GIANNI ha vinto una competizione importante, non Piero; inoltre, ha vinto I MONDIALI, non le olimpiadi

'You are wrong: this year GIANNI won an important competition, not Piero; moreover, he won THE WORLD CHAMPIONSHIP, not the Olympics.

Uniqueness of focus (in clefts) and multiplicity of topics in French

(1) Je donnerai ton livre à Jean demain

'I will give your book to Jean tomorrow'

(2) Ton livre, à Jean, je le lui donnerai __ __ demain

'Your book, to Jean, I it-to him will give __ __ tomorrow'

(3) * C'est à Jean que c'est ton livre que je donnerai __ __ demain

'It's to Jean that it's your book that I will give __ __ tomorrow'

Some examples of uniqueness of LP focus I

(1) Italian: * A MARIA (,) IL TUO LIBRO devi dare (non a Giulia, il disco) (Rizzi 1997)

(2) English: * TO MARY (,) YOUR BOOK you should give (not to Julie, the record

(3) (E)Armenian: * YEREK SALORN ê Siranə kerel (Giorgi & Haroutyunian 2016)

'YESTERDAY THE PLUM has Siran easten'

(4) Hungarian: * EMÖKE ATTILÁVAL beszélt

Emöke-NOM Attila-INSTR talk-PAST-3SG (Puskas 2000: 83)

Some examples of uniqueness of LP focus II

(5) Hebrew: * le Maria (,) et ha sefer Sel-xa kedai Se titen (lo le Giulia et ha qaletet)
to M. acc the book of-2ms worthwhile that (you) give (not to G. acc the DVD)
(U. Shlonsky, p.c.. See also Shlonsky 2015)

(6) Jamaican: * A di bami a di pikni im gi
The bammy the child he give (Durrleman 2008:75)

(7) Gungbe: * wémà lɔ **wɛ** Sɛna **wɛ** zé
THE BOOK SENA took (Aboh 2004)

(8) Abidji: * òkókò$_i$ é **bé** kòfí$_j$ **bé** ____ pìpjé ____
banana$_i$ Def. Foc Kofi$_j$ Foc ___ peel.RES ___
« THE BANANA, KOFI ___ peeled ___ » (Hager-Mboua 2014)

An interface explanation: A recursive focus would determine an interpretive conflict at LF

(1) [ ] **Foc** [ ]

“Focus” “Presupposition”

(2) * [A MARIA] **Foc1** [[IL TUO LIBRO] **Foc2** [devi dare]]]

‘To MARIA YOUR BOOK you should give

Topic interpretation is compatible with recursion

(1) [ ] Top [ ]

“Topic” “Comment”

(2) [A Maria] **Top1** [[il tuo libro] **Top2** [glielo devi dare]]]

‘To Maria your book you it-to-him should give

Variation on Foc in distinct clauses and the role of PF interface: Italian

In some languages, a single LP focus position is possible in complex sentences (e.g., Italian):

(1)a. A GIANNI ho detto __ che dovremmo leggere il tuo libro, non a Piero
'TO GIANNI I said that we should read your book, not to Piero'

b. Gli ho detto che IL TUO LIBRO dovremmo leggere __, non quello di Franco
'I said to him that YOUR BOOK we should read, not Franco's''

c. *A GIANNI ho detto __ che ILTUO LIBRO dovremmo leggere __, non a Piero, quello di Franco
'TO GIANNI I said that YOUR BOOK we should read, not to Piero, Franco's'

Variation on Foc in distinct clauses and the role of PF interface: Gungbe

In other languages, more than one LP focus position is possible in complex sentences (one per clause, e.g., in Gungbe):

(2)a Sena **wὲ** __ sὲ ɖɔ Remi **wὲ** __ zé hi lɔ

Sena Foc hear-Perf that Remi Foc __ take-Perf knife +def

'SENA heard that REMI took the knife'

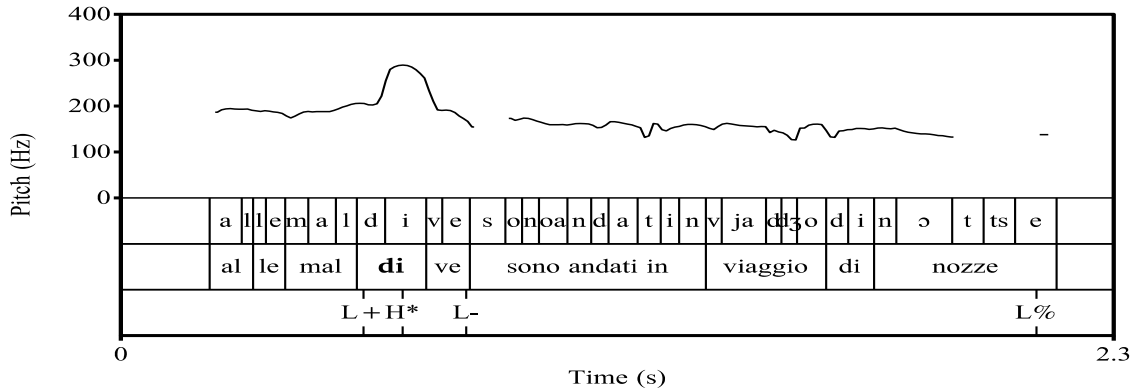
b Sena **wὲ** __ sὲ ɖɔ hi lɔ **wὲ** Remi zé __

Sena Foc hear-Perf that knife +def Foc Remi take+perf

'SENA heard that Remi took THE KNIFE'

The role of the PF interface

- Special intionational contour in **Italian** precludes multiple foci in complex clauses:



- No special contour in **Gungbe**: focus is marked by the special particle **wɛ̀**, not by intonation (Aboh 2004). So, nothing precludes the occurrence of foci in distinct clauses. Multiple occurrences of focus in the same clause continues to be excluded by the LF clash mentioned earlier.

Variation in topic constructions: Uniqueness vs. multiplicity of topics, and the role of locality

In Italian (and many other languages) multiple topics are possible:

(1) Gianni, la macchina, lo ho convinto ad affittarla
'Gianni, the car, I him-convinced to rent-it'

In English, a single topic per clause is possible:

(2)a John, I convinced __ to rent the car

b The car, I convinced John to rent __

c * John, the car, I convinced __ to rent __

An independent difference between English and Italian

In English, the topic is linked to a gap: in Italian, an object topic is obligatorily resumed by a clitic:

(1) Your book, John will give __ to Mary

(2)a Il tuo libro, Gianni **lo** darà __ a Maria

b * Il tuo libro, Gianni darà __ a Maria

Why is clitic resumption obligatory in Italian?

Cinque (1990): a gap not bound with the clause is interpreted as a variable, but the topic is not an operator, so a variable remains unbound, in violation of general interpretive principles.

What about English?

Topicalization in English

Chomsky 1977, Cinque 1990: English has no clitics, but it may utilize a null operator (of the kind used in many constructions across languages, appositive relatives, etc.) to connect the topic and the variable:

(3) Your book, **Op** I will give __ to Mary

This analysis is made immediately plausible by the fact that in closely related languages, like Dutch, topicalization may use an overt operator:

(4) Die man (**die**) ken ik __ (Dutch: Koster 1978)

'That man, I know'

Intervention effects and Relativized Minimality

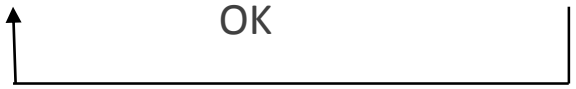
Relativized Minimality:

In configuration ... X ... Z ... Y ... A local relation is disrupted between X and Y when:

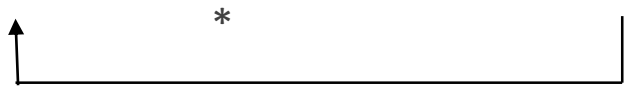
1. Z hierarchically intervenes between X and Y, and
2. Z is a position of the same type as X

(Rizzi 1990, 2004, 2013, Starke 2001, Friedmann, Belletti & Rizzi 2009)

(1) **What** do you think [**John** read __]?



(2) * **What$_Q$** do you wonder [**who$_Q$** read __]?



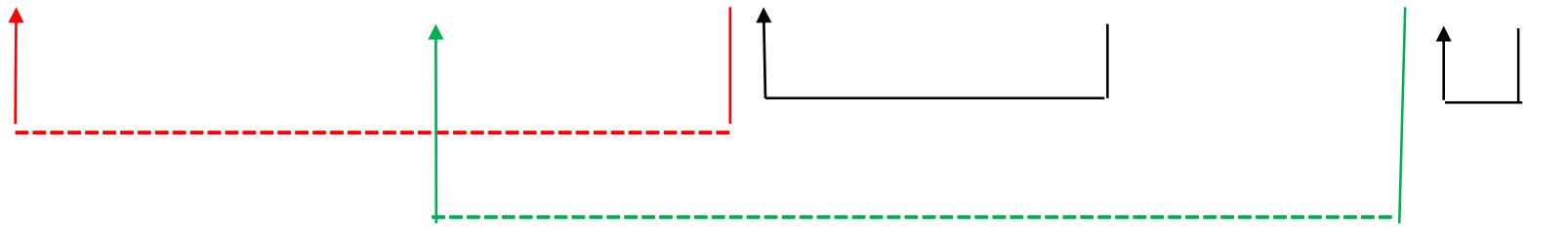
The ban against double topic in English as a RM effect

(1) * John **Op** the car **Op** I convinced __ to rent __

If topicalization involves a null operator in English, in cases of double topicalization one operator will inevitably move across the other, in violation of RM.

No violation of RM in the Romance languages

(1) Gianni Top la macchina Top lo ho convinto __ ad affittarla __



'Gianni the car I him-have convinced to rent-it'

In Romance, as topics do not involve operators, multiple topics do not violate RM.

Here the connection between the topic and the gap is broken into two relation: the local relation between the clitic and the gap, and the relation between the topic and the clitic. The latter relation is not necessarily local: relations between antecedents and pronouns are not local, can survice across islands, etc.

Conclusion

Cartographic research has a large descriptive dimension focusing on the details of syntactic structures. The program leads to the discovery of numerous properties of syntactic representations, in particular properties of the functional sequences associated to lexical elements.

These discoveries raise the issue of explanation: how can the observed properties be deductively connected to plausible elementary principles of syntactic computations? Cartographic results can nourish theoretical comparative syntax by enriching its empirical basis and raising issues of «further explanation».

Certain forms of invariance and variation in properties of topic and focus structures can be traced back to interface and locality principles, in interaction with language-specific properties, such as the assignment of a special intonational contour to focus structures, and the particular device used to connect a topic and a gap.

MERCI!