

LING819: Possible and Impossible Structures

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1 The beginning of Cartography

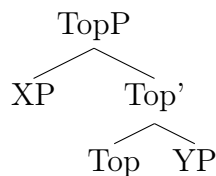
- (1) The simple clause structure that emerges in Chomsky (1986) makes strong predictions about the number of positions in the clause.
- (2) Pollock (1989) presents data that show that more positions are necessary, on the assumption that the position of adverbials is constant (cf. Emonds (1978)).
- (3)
 - a. ne pas complètement comprendre la théorie ...
NEG not completely understand the theory
 - b. ne pas comprendre complètement la théorie ...
 - c. Il ne comprend pas complètement la théorie.
- (4)
 - a. John often kisses Mary.
 - b. *John kisses often Mary.
- (5)
 - a. *Jean souvent embrasse Marie.
 - b. Jean embrasse souvent Marie.
- (6) John will often write papers.
- (7) ‘Agr I will assume is a category in its own right, to be distinguished from Tense, which is the head of what has so far been called Infl. We might more appropriately call the latter T(ensue) and its maximal projection TP’ (Pollock 1989: 383).
- (8) For Pollock, Agr is a complement of T.
- (9) Belletti (1990) and others have argued that the order should be the opposite, based on facts about prefixes in Bantu languages. Languages like Romance also do not constitute a counter-example, Belletti argues.
- (10) parl-av-ano (Italian)
speak-TENSE-AGR.S
‘They spoke.’
- (11) ‘In particular, the idea that there is an AgrP in English and French is obviously not meant as a universal: languages could differ precisely along that dimension. [...] Also, pending further work on the structure of UG and its parameters, languages

could in principle vary in the order of embedding of AgrP and TP. In a similar spirit, it is plausible to assume that some languages could analyze their Agr as a specifier of TP rather than as its complement' (Pollock 1989: 384, fn. 19).

2 Cartography in Italian and English

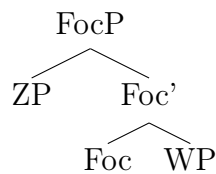
- (12) Rizzi (1997) focuses especially on topic and focus in his paper.
 (13) Your book, you should give t to Paul (not to Bill)
 (14) The topic typically expresses old information, and the comment is some kind of complex predicate.
 (15) YOUR BOOK you should give t to Paul (not mine)
 (16) The preposed element introduces new information and the open sentence expresses contextually given information.
 (17) The interpretive relation is therefore 'virtually the opposite in the two cases' (Rizzi 1997: 285).

(18)



- (19) XP = topic
 YP = comment
 (20) 'Top defines a kind of "higher predication", a predication within the Comp system; its function is thus analogous to the function of AgrS within the IP system, which also configurationally connects a subject and a predicate. The most basic difference between higher and lower predication is that the former involves a specifier which is an A' position' (Rizzi 1997: 286).

(21)



- (22) ZP = focus
 WP = presupposition
 (23) Force and Fin are present in all non-truncated structures. The Topic-Focus system is only present when needed.
 (24) ... Force ... (Topic) ... (Focus) ... Fin IP

2.1 Italian cartography

- (25) This can already account for some patterns in Italian involving the complementizers *che* and *di*:

- (26) a. Credo che loro apprezzerebbero molto il tuo libro
 ‘I believe that they would appreciate your book very much’
 b. Credo di apprezzare molto il tuo libro
 ‘I believe ‘of’ to appreciate your book very much’
- (27) a. Credo che il tuo libro, loro lo apprezzerebbero molto
 ‘I believe that your book, they would appreciate it a lot’
 b. *Credi, il tuo libro, che loro lo apprezzerebbero molto
 ‘I believe, your book, that they would appreciate it a lot.
- (28) a. *Credo di il tuo libro, apprezzarlo molto
 ‘I believe ‘of’ your book to appreciate it a lot’
 b. Credo, il tuo libro, di apprezzarlo molto
 ‘I believe, your book, ‘of’ to appreciate it a lot’
- (29) ‘This distribution is hardly consistent with a theory assuming a unique C position, while it can be immediately expressed within the current articulated theory of C by assuming that *che* manifests the force position, while *di* manifests the finiteness position, hence they show up on opposite sides of the topic’ (Rizzi 1997: 288).
- (30) Different operators also have different positions in the C system. In Italian, relative operators must precede topics, while question operations must follow topics in main questions and can follow or (somewhat marginally) precede them in embedded questions (Rizzi 1997: 289):
- (31) a. Un uomo a cui, il premio Nobel, lo daranno senz’altro
 ‘A man to whom, the Nobel Prize, they will give it undoubtedly’
 b. *Un uomo, il premio Nobel, a cui lo daranno senz’altro
 ‘A man, the Nobel Prize, to whom they will give it undoubtedly’
- (32) a. *A chi, il premio Nobel, lo daranno?
 ‘To whom, the Nobel Prize, will they give it?’
 b. Il premio Nobel, a chi lo daranno?
 ‘The Nobel Prize, to whom will they give it?’
- (33) a. Mi domando, il premio Nobel, a chi lo potrebbero dare
 ‘I wonder, the Nobel Prize, to whom they could give it’
 b. ?Mi domando a chi, il premio Nobel, lo potrebbero dare
 ‘I wonder to whom, the Nobel Prize, they could give it’
- (34) Relative operators are in SpecForceP, while question operators are in a lower position in the Topic/Focus field.
- (35) Rizzi presents a number of differences between topics and focus (Rizzi 1997: 289-291).
1. Resumptive clitic
 - (25) A topic can involve a resumptive clitic (and it is obligatory if the topic is the direct object), a focalized constituent cannot.
 - (26) Il tuo libro, lo ho comprato
 ‘Your book, I bought it’

- (27) *Il tuo libro, ho comprato t
'Your book, I bought'
- (28) *IL TUO LIBRO lo ho comprato (non il suo)
'YOUR BOOK I bought it (not his)'
- (29) IL TUO LIBRO ho comprato t (non il suo)
'YOUR BOOK I bought (not his)'

2. Weak crossover

- (30) A topic never creates a weak crossover effect, a focus does.
- (31) Gianni₁, sua₁ madre lo₁ ha sempre apprezzato
'Gianni, his mother always appreciated him'
- (32) ??GIANNI₁, sua₁ madre ha sempre apprezzato t₁ (non Piero)
'GIANNI his mother always appreciated, not Piero'

3. Bare quantificational elements

- (33) Bare quantificational elements cannot be topics in clitic left dislocation constructions, but they easily allow focalization.
- (34) a. *Nessuno, lo ho visto
'Noone, I saw him'
- b. *Tutto, lo ho fatto
'Everything, I did it'
- (35) a. NESSUNO ho visto t
'NOONE I saw'
- b. TUTTO ho fatto t
'Everything I did'

4. Uniqueness

- (36) Multiple topics are allowed, but multiple focus not:
- (37) Il libro, a Gianni, domani, glielo darò senz'altro
'The book, to John, tomorrow, I'll give it to him for sure'
- (38) *A GIANNI IL LIBRO darò (non a Piero, l'articolo)
'TO JOHN THE BOOK I'll give, not to Piero, the article'
- (39) In cases where topic and focus are combined, the focal constituent can be both preceded and followed by topics:
- (40) A Gianni, QUESTO, domani, gli dovrete dire
'To Gianni, THIS, tomorrow, you should tell him'

5. Compatibility with wh

- (41) A wh-operator in main clauses is compatible with a topic in a fixed order (Top wh), whereas it is incompatible with Focus:

- (42) a. A Gianni, che cosa gli hai detto?
 ‘To Gianni, what did you tell him?’
 b. *Che cosa, a Gianni, gli hai detto?
 ‘What, to Gianni, did you tell him?’
- (43) a. *A GIANNI che cosa hai detto (, non a Piero)?
 ‘TO GIANNI what did you tell (, not to Piero)?’
 b. *Che cosa A GIANNI hai detto (, non a Piero)?
 ‘What TO GIANNI did you tell (, not to Piero)?’

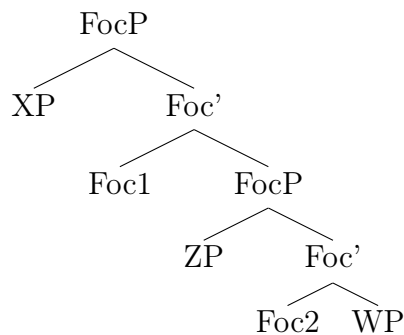
(44) Let us consider the fourth difference in some more detail:

- (45) a. Credo che a Gianni, QUESTO, domani, gli dovremmo dire
 ‘I believe that to Gianni, THIS, tomorrow we should say’
 b. Credo che domani, QUESTO, a Gianni, gli dovremmo dire
 c. Credo che domani, a Gianni, QUESTO gli dovremmo dire
 d. Credo che a Gianni, domani, QUESTO gli dovremmo dire
 e. Credo che QUESTO, a Gianni, domani, gli dovremmo dire
 f. Credo che QUESTO, domani, a Gianni, gli dovremmo dire

(46) ... C (Top*) (Foc) (Top*) ...

(47) Why the difference between recursive Top and non-recursive Foc?

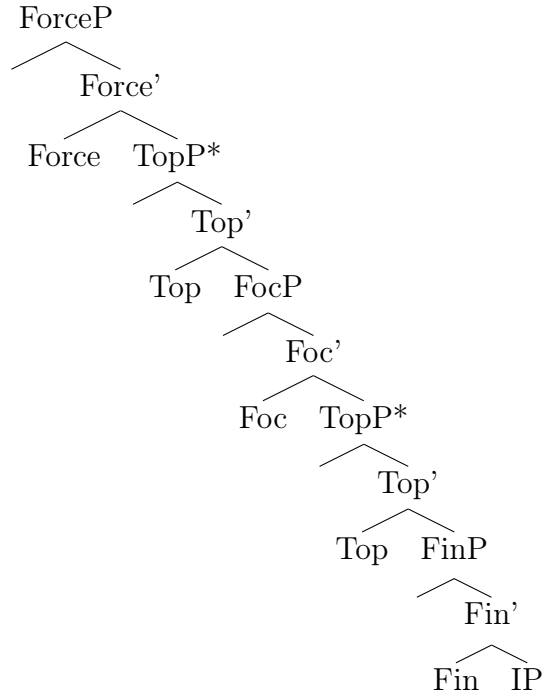
(48)



(49) ‘Such a structure would contain a focus position ZP, the specifier of the lower focal head, Foc2. But this would be inconsistent with the proposed interpretation: YP is the presupposition of the higher focal head Foc1, and as such it can only specify given information. So, recursion of FocP is banned by the interpretive clash that would arise’ (Rizzi 1997: 297).

(50) Overall we now have the following structure:

(51)



(52) Rizzi (1997) has also clearly demonstrated that there is a close syntactic relationship between *wh*-phrases and focus.

(53) The examples in (54)-(55) (taken from Rizzi 1997: 298) show that a focalized constituent and an interrogative constituent are incompatible.

(54) *A chi IL PREMIO NOBEL dovrebbero dare?
to whom the prize nobel should.they give
'To whom THE NOBEL PRIZE should they give?'

(55) *IL PREMIO NOBEL a chi dovrebbero dare?
the nobel prize to whom should.they give
'THE NOBEL PRIZE to whom should they give?'

(56) Rizzi takes the complementary distribution to suggest that *wh*-phrases and focused phrases move to the same projection in the left periphery.

2.2 English cartography

(57) Consider the following data (from Radford (2009)).

(58) *No other colleague* would be turn to.

(59) I am absolutely convinced [that *no other colleague* would he turn to]

(60) Specifically, Rizzi argues that the topmost projection is a ForceP, and below ForceP there are both focus and topic phrases. The lowest projection in the split CP is FinP.

(61) *No other colleague* will be in SpecFocP and *that* will be the head of ForceP.

(62) Where is TopicP relative to other constituents?

- (63) He had seen something truly evil - prisoners being ritually raped, tortured and mutilated. He prayed that *atrocities like those, never again would he witness*. (Radford 2009)
- (64) This example shows that ForceP is above TopP and TopP is above FocP.
- (65) Somehow we then need to ensure that the finite auxiliary *would* does not raise from Foc to Top.
- (66) If this is roughly the general picture, then we wonder how *wh*-movement should be analyzed.
- (67) As for main clauses, Rizzi argues that *wh*-expressions move to SpecFocP, and that there can only be one structural focus position in the clause.
- (68) The latter claim accounts for why the following data are not acceptable (Radford 2009):
- (69) a. *What never again will you do?
 b. *Wha will never again you do?
 c. *Who where did he send?
 d. *Who did where he send?
- (70) The following evidence supports FocP over ForceP:
- (71) a. **That kind of behavior**, *how* can we tolerate in a civilized society?
 b. **How* can **that kind of behavior** we tolerate in a civilized society?
- (72) Why cannot the *wh*-word precede the topic? This has to do with the syntax of *can* and the assumption that Topic cannot attract *can* from T so that it can move on to Foc.
- (73) What about embedded clauses?
- (74) Rizzi argues that an interrogative *wh*-expression occupies SpecForceP in complement clauses. He provides the following evidence:
- (75) a. Lee wonders [whether under no circumstances at all would Robin volunteer].
 b. Lee wonders [why under no circumstances at all would Robin volunteer].
- (76) Further evidence (Radford 2009):
- (77) a. I cannot see [**how**, *this kind of behavior*, we can tolerate in a civilized society].
 b. *I cannot see [*this kind of behavior*, **how** we can tolerate in a civilized society].
 c. I'm not sure [*what kind of ban* **that** FIFA has in mind]. (Colloquial English)
 d. We'll see [*what sort of pace* **that** Daley Thompson's running at]. (Colloquial English)
- (78) Interrogative *wh*-words have a dual character: the can both be used for focusing and to mark interrogative force.
- (79) Chomsky (1995), Harley (1995), Sternefeld (1995), Kratzer (1996), Stechow (1996), Alexiadou et al. (2006), Folli and Harley (2007), Pylkkänen (2008), Ramchand (2008), Sailor and Ahn (2010) all argue that there is a separate head that introduces the Agent/subject.

- (80) Radford (2009) argues that the following data suggests that the VP be split into two projections:
- (81) a. He rolled [the ball] [down the hill]
 b. He filled [the bath] [with water]
 c. He broke [the vase] [into pieces]
 d. They withdrew [the troops] [from Ruritania]
- (82) A ternary structure won't work because of the following data, taken from from Barss and Lasnik (1986).
- (83) a. I showed the professors each other's students.
 b. *I showed each other's students the professors.
 c. I showed John himself in the mirror.
 d. *I showed himself John in the mirror.

2.3 The middle field

- (84) Cinque (1999) extends the cartographic approach to the 'middle field'.
- (85) Adverbs 'should not be seen as accessory appendices to clause structure (as the traditional notion of 'adjunct' would suggest), but rather as an integral part of it' Cinque (2004: 693).
- (86) The logic: Consider A1 and A2. It is possible to establish an order between these two. Suppose the order is $A1 > A2$. Then introduce A3. here are only three possible orders: $A3 > A1 > A2$, $A1 > A3 > A2$ or $A1 > A2 > A3$.
- (87) We need to test the order of A1 and A3. if A3 precedes A1, then, by transitivity, it should precede A2. If A3 follows A1, then further tests are necessary.
- (88) Consider the following example from English (Shlonsky 2010: 421).
- (89) a. He's often always late.
 b. *He's always often late.
- (90) a. He's usually often late.
 b. *He's often usually late.
- (91) a. He's usually always late.
 b. *He's always usually late.
- (92) This gives us *usually > often > always*.
- (93) Cinque (1999) also shows that a verb can appear between any two adverbs. (Shlonsky 2010: 421), based on Cinque (1999: 45) shows that the Italian past participle *rimesso* 'put back' can not only appear either to the left or to the right of the adverb series, but, crucially, in between any pair of adverbs:
- (94) a. Non hanno *rimesso* di solito sempre completamente le cose a posto
 neg have.3pl put.back usually always completely the things in place
 b. Non hanno di solito *rimessp* sempre completamente le cose a posto
 neg have.3pl usually put.back always completely the things in place

- c. Non hanno di solito sempre *rimesso* completamente le cose a posto
 neg have.3pl usually always put.back completely the things in place
- d. Non hanno di solito sempre completamente *rimesso* le cose a posto
 neg have.3pl usually always completely put.back the things in place
 ‘They haven’t usually always completely put back the things in place.’
- (95) The most economical structural expression of these facts:
- (96) *usually X always X completely X*
- (97) Scholars such as Ernst (2002) argue against Cinque. One argument concerns the apparent non-rigid ordering of adverbs.
- (98) a. She frequently was suddenly (being) rejected by publishers.
 b. She suddenly was (being) frequently rejected by publishers.
- (99) There is independent evidence that *frequently/often/rarely* occur in two distinct positions, one above and one below *wisely, suddenly* etc.
- (100) She rarely/often frequently was suddenly (being) frequently rejected by the publishers.
- (101) ‘The fact that there is a systematic relation between these two usages may suggest (rather than ambiguity, or, worse, homonymity) the existence of a common core between the two interpretations. If the lexical item only expresses this common core, it is unspecified with respect to the two positions; hence compatible with both’ (Cinque 2004: 693).
- (102) ‘Cinque shows that the order of adverbs can be matched with the crosslinguistically stable order of heads such as inflectional affixes, functional particles, preverbs of different sorts and auxiliaries’ (Shlonsky 2010: 422).
- (103) ‘Whatever the actual number of features turn out to be, it will surely be a subset of the properties which enter into cognition, thought or communication. Just as there are certain participant roles which appear to lie outside the realm of thematic role encoding (vix. Reinhart (2002)), there are perceptual/cognitive categories that do not appear to be coded as functional features: “For example, various syntactic processes make use of the singular/plural distinction, but none so far as I know ever make use of the red/orange distinction’ (Jackendoff 1987: 381)’ (Shlonsky 2010: 424-425).
- (104) ‘To the degree that this hierarchy feeds semantic computation, one expects a tight correspondence between the ordering of the rules of semantic composition and the cartographic sequence. This is largely true’ (Shlonsky 2010: 425).
- (105) ‘As hinted at in Cinque (1999: 224 fn. 10 and related text), a purely semantic scope principle of the conceptual-intentional interface provides by itself no understanding of why we find in the languages of the world the specific classes of adverbs (and corresponding functional heads) that we find, rather than some different assortment. Surely there are many more semantic notions in our conceptual-intentional world than those that receive grammatical expression (are grammaticalized) in the languages of the world Cinque (2004: 685).

- (106) ‘So, for example, one find evidential adverbs and evidential mood morphology (expressing the speaker’s source of information for his/her assertion), but as far as I know no language grammaticalizes through verbal morphology, particles, or adverbs, the speaker’s sentimental attitude toward his/her assertion (whether what he/she says is said with love or with hate: e.g. *John is lovingly coward* = I am saying it with love that John is a coward), nor many other imaginable notions. Clearly, it is an ‘accident’ of evolution if UG has come to look the way it does, with certain functional distinctions (and related adverb classes) rather than others’ Cinque (2004: 685-686).
- (107) ‘In the absence of a complete understanding of the semantics of each adverb class, from which its scope with respect to the other adverb classes can be made to follow, a claim such as Ernst’s (2002: 130-133) that, *as a consequence of their lexicosemantic properties*, speaker- and subject-oriented adverbs have a rigid ordering while quantificational and aspectual adverbs can have a variable ordering (with meaning differences), and participant PPs have a free ordering (with no meaning differences), essentially restates the question rather than explaining it’ (Cinque 2004: 685 fn. 5).
- (108) ‘Cartographic work is not very explicit as to how the hierarchy of heads is formally guaranteed. If it is derived by precise statements of selection (e.g. Asp 27 selects Asp26), then it follows that the entire cartographic hierarchy must be merged in every full clause’ (Shlonsky 2010: 426).
- (109) ‘The question whether such universal hierarchies of functional projections are primitive objects of UG, or can be derived from interface or more general external conditions is important, but fundamentally orthogonal to the prior task of drawing their precise map, and perhaps not easily determinable at the present state of our knowledge’ (Cinque and Rizzi 2008: 45).

3 Cartography and the Minimalist Program

- (110) ‘There is, at first sight, an inherent tension between the complexity of the cartographic representations and the simplicity of the generative devices that minimalist syntax assumes, somehow reflected in the structural poverty of the representations typically found in the minimalist literature’ (Cinque and Rizzi 2008: 49).
- (111) ‘We believe that there is no contradiction between these two directions of research, and the tension, where real, is the sign of a fruitful division of labor. Minimalism focuses on the elementary mechanisms which are involved in syntactic computations, and claim that they can be reduced to extremely simple combinatorial operations, ultimately external and internal Merge, complicated by some kind of search operation (Chomsky’s Agree) to identify the candidates of Merge. An impoverished computational mechanism does not imply the generation of impoverished structure: a very simple recursive operation can give rise to a very rich and complex structure, as a function of the inventory of elements it operates on, and, first and foremost, of its very recursive nature’ (Cinque and Rizzi 2008: 49).
- (112) ‘The division of labor here is that Minimalism focuses on the generating devices, and cartography focuses on the fine details of the generated structures, two research

topics which can be pursued in parallel in a fully consistent manner, and along lines which can fruitfully interact [...]’ (Cinque and Rizzi 2008: 49).

- (113) ‘An objection which is sometimes raised against this view is that it seems to threaten the thesis of the autonomy of syntax. Granting the historical important of the autonomy thesis in the process of properly structuring a rigorous and well-defined theory of syntax, we fail to see the force of this objection. First of all, we do not see why this conception should be perceived as more of a threat to the autonomy of syntax than the Theta Criterion, or the Projection Principle, or the theta-related character of inherent case assignment, or any other principle aiming at illustrating the transparency (ultimately, the simplicity) of the mapping between form and interpretation’ (Cinque and Rizzi 2008: 51).
- (114) ‘The cartographic studies can be seen as an attempt to "syntacticize" as much as possible the interpretive domains, tracing back interpretive algorithms for such properties as argument structure (Hale and Keyser 1993 and much related work), scope, and informational structure (the "criterial" approach defended in Rizzi 1997 and much related work) to the familiar ingredients uncovered and refined in half a century of formal syntax. To the extent to which these efforts are empirically supported, they may shed light not only on syntax proper, but also on the structure and functioning of the cognitive system at the interface with the syntactic module’ (Cinque and Rizzi 2008: 52).
- (115) ‘[...] phases (CP and *v*P) and their edges (i.e. their heads and specifiers) play a key role in the computation of locality in Minimalist syntax. It is far from clear how to integrate these notions into the structural maps of cartography, in which the clause is typically seen as a *homogenous* hierarchy of projections’ (Shlonsky 2010: 426).
- (116) ‘Perhaps an even more nagging problem is that of selection. Minimalism inherits from previous approaches the view that selection is carried out under sisterhood. Thus, C selects T and V selects C. How is selection satisfied, for example an indirect question, if the head bearing the interrogative feature is Foc or Int (cf. Rizzi 2001) and thus not a sister to V? Or take the familiar problem of how subjunctive features on an inflectional head can be selected by a higher predicate, given the number of intervening heads between V and the relevant mood head? The locality of selection plays a major role in Chomsky’s most recent work (Chomsky 2008; see also Richards 2007), in which C transfers Case features to T. Which C? Which T?’ (Shlonsky 2010: 427).
- (117) ‘Moreover, at least some of the researchers that participate in the Cartographic Project share the assumption that this very rich and detailed structure is a permanent part of Universal Grammar (UG). This seems to go in a direction that is not consistent with the minimalist view, according to which grammar is a perfect engine, where nothing is superfluous and various kinds of principles of minimal effort are frequently appealed to. Admittedly, a series of heads, yet to be determined in number and expressing minimal differences, may seem decidedly redundant (as has been observed, e.g., with respect to the modal and aspectual projections proposed in Cinque 1999). Yet, redundancy has been traditionally observed in grammar, but

we believe that this redundancy is only apparent, pre-theoretical. If we take biology, for example, we see that surrogate elements in many cases ensure the survival of injured bodies, as an effect of a sort of redundancy of the living organisms. Organisms, though, are not built as they are in order to be equipped to supply spare parts when necessary; they simply are very rich and sophisticated, and if something is damaged, the whole of the organism in many cases makes up for the malfunctioning of a subpart. For example, we do not have two hands in order to have a spare one if one of them is injured - hands are two for very complex, independent reasons; yet, if one of them does not work, we are able to manage and learn how to use the other and partly offset the functions of the lost one, as is the case for a spare tire' (Benincà and Munaro 2010: 5).

- (118) 'Languages, also, when observed naively, seem to manifest many sorts of apparent redundancy. For example, we see that some languages have verbal endings that identify the subject of the verb, such as Italian and Spanish; some have practically no endings, but subject pronouns or noun phrases that play the same role, such as English or Chinese; and many have both, such as German, French and Paduan. Traditionally, this last case has been described in terms of redundancy. Similarly, some languages have empty categories corresponding to a dislocated element, while some have clitics resuming and identifying it; this latter case, too, is traditionally considered an example of redundancy. We claim that such apparent duplications are not redundancies. (Benincà and Munaro 2010: 5).
- (119) 'If we assume that all grammars are the same, the apparent redundancy consists in the fact that the functional apparatus of Grammar is richer than meets the eye, and not all of its parts have to be made visible on the surface in every language. Then, what is visible in one language must be present but invisible in another. Redundancy indicates that where a language shows, for example, only one functional element, while another has two, Grammar has at least two [...] (Benincà and Munaro 2010: 5).
- (120) 'The theory of syntax has now reached a level of detail that renders it more easily comparable to phonology. We talk of features as the minimal components of grammar, which meanings and functions are made of, like with the sounds of language. The universal inventory of phonological features is a closed list, and the number of their possible combinations is far richer than the set of feature combinations used by any single language. Some combinations are universally impossible, some are marked and rare, and no language uses all the combinations; on the contrary, all languages use just a few' (Benincà and Munaro 2010: 6-7).
- (121) Another question here concerns the nature of the features: Are interpretable features on the functional heads or on the phrases that the heads agree with? Or is it the other way around?

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