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*Functional Structure in DP and IP: The Cartography of Syntactic Structures,*

*Volume 1*

Edited by Guglielmo Cinque

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# Functional Structure in DP and IP

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## *The Cartography of Syntactic Structures, Volume 1*

EDITED BY  
GUGLIELMO CINQUE

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## Mapping Functional Structure: A Project

GUGLIELMO CINQUE

This volume presents the first results of a long-term research project aiming at the discovery and mapping out of the functional structure of natural language sentences.<sup>1</sup> The impetus of the study of functional structure, after Chomsky (1986, 3) first suggested extending the X-bar format to the nonlexical categories of Inflection and Complementizer, can be traced back to some fifteen years ago, with Abney (1987) for the DP, and Pollock (1989) for the sentence, with subsequent modifications by Belletti (1990), Ouhalla (1991), and Chomsky (1993), among others.

Since then, the amount of work produced in the study of functional structure, on a variety of languages, has grown to such an extent that a systematic mapping of the various functional heads found in the sentence and other phrases of the languages of the world has become appropriate, if not imperative. The idea is that we are at a point when it is finally possible to set the question in a systematic and empirical fashion, by having the various types of evidence considered in the literature interact and converge onto distinct functional hierarchies for each phrase.

What makes the enterprise all the more interesting is the mounting evidence of the last several years that the distinct hierarchies of functional projections may be universal in the inventory of the heads they involve, in their number, and in their relative order (despite certain appearances). This is, at any rate, the strongest position to take, as it is compatible with only one state of affairs. It is the most exposed to refutation, and, hence, more likely to be correct, if unrefuted.

In front of recalcitrant facts we might be led to a weaker position—one that allows languages to vary either in the inventory, or the number, or the order of the functional heads that they admit (or any combination thereof). Even if this position should eventually turn out to be right, methodologically it would be wrong to start with it,

discarding the stronger position. That would only make us less demanding with respect to the facts and could lead us to miss more subtle evidence supporting the stronger position (a risk not present under the other option).

To see how the systematic mapping of such universal and invariant hierarchies might be carried out, let me briefly review the principal kinds of evidence considered in the literature and also utilized in the chapters contained in this volume.

One first source of evidence for positing functional projections other than the D(eterminer)P, the I(nflection)P, and the C(omplementizer)P recognized in the early work mentioned above was provided by word order considerations. One such case is Pollock's (1989) classical argument for positing a nonlexical head higher than V, head of VP, and lower than I (or T), to which only finite verbs raise in French. His suggestion was that such word order alternations as (1)a–b, involving infinitives, could be accounted for directly if we take the infinitive to raise out of VP to a head higher than *complètement* (in the 1b. example), and lower than negation (and T).<sup>2</sup>

- (1) a. (ne pas) *complètement perdre la tête*  
'not completely lose one's mind'  
b. (ne pas) *perdre complètement la tête*

This kind of consideration provides evidence (pace Chomsky 2001) for the existence of a nonlexical head category distinct from T but offers little insight into the exact label or function of that category and projection (Mitchell 1994, 9–10).<sup>3</sup> Despite this indeterminacy, such considerations offer important clues to the abstract skeleton of the underlying functional structure—one that may one day be fleshed out on the basis of independent morphological evidence.

More recent similar arguments based on word order considerations are Kayne's (1998, 1999) W head and Pollock, Munaro, and Poletto's (1999) G head.

A second strand of evidence for functional structure is provided by the inventory of functional (more traditionally, "grammatical") head morphemes of the languages of the world. This evidence offers a direct insight into the label of the functional categories which are expressed grammatically across languages, as well as into their number and order.

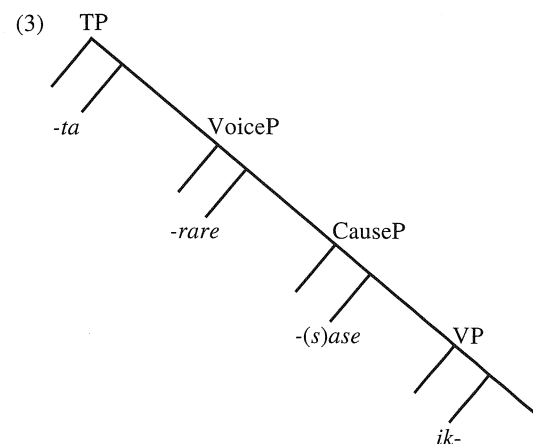
The most insightful and influential proposal concerning the cross-linguistic order of functional heads is surely Baker's (1985, 1988) Mirror Principle, which recognized the existence of a systematic relation between the order of bound morphemes in morphology and the order in which syntactic operations affect the corresponding free morphemes in the bottom-up syntactic derivation of the sentence: syntactic operations that correspond to affixes closer to the verb stem precede syntactic operations that correspond to affixes further away from the verb stem.<sup>4</sup>

For example, just as passivization in Italian applies after syntactic causativization has turned the subject of the embedded verb *andare* 'go' into the object of the complex predicate *far andare* 'make go' formed by the causative and the embedded verb (see (2)a), so the passive suffix *-rare* in Japanese is added after the causative suffix *-(s)ase* (see (2)b):

- (2) a. Gianni fu fatto andare.  
G. be.PAST causativeV-PASS go  
'G. was made to go.'

- b. Hanako ga ik-ase-rare-ta. (see Miyagawa 1989, 151)  
H. NOM GO-CAUS-PASS-PAST  
'H. was made to go.'

While the rough mirror relationship between the order of suffixes and the order of the corresponding free morphemes in "head-initial" languages (particles and auxiliaries), was also noted by other linguists (Bybee 1985; Dik 1989),<sup>5</sup> Baker (1985, 1988) went further in suggesting a way to obtain it on the basis of independent syntactic principles (such as the Empty Category Principle subsuming Travis's 1984 Head Movement Constraint). The idea, further refined in subsequent work by Pollock (1989), Belletti (1990), Ouhalla (1991), and Chomsky (1991), was essentially that affixal morphology is built into the syntax, subject to the same constraints that govern syntactic operations, each suffix being treated as a bound morpheme in head position in need of a host. Such a host is provided by the lower head, which raises and left-adjoins to it. In both "head-final" and "head-initial" languages, this has the effect of reversing the order of heads into their mirror image:<sup>6</sup>



Apparent difficulties for a literal derivation of both derivational and inflectional morphology in the syntax are provided by a number of irregularities, however. For example:

*Syncretism*—when one morpheme encodes more than one functional notion, as with the Italian verbal suffix *-v-*, which encodes both imperfective aspect and past tense.

*Suppletion*—failure of regular compositionality, as when an entirely different stem is selected in the presence of a certain functional feature: see *went* in place of *go* + *ed* in English.

*Multiple Exponence*—when a single functional notion is apparently encoded in two, or more, morphemes, as with the Modern Greek selection of a particular stem in the presence of a particular functional notion (say *pli-*, instead of *plen-* or *plin-*, in the presence of nonactive voice, which is also expressed by the suffix *th-*. See Joseph and Smirniotopoulos 1993.<sup>7</sup>

For a discussion of these and other irregularities, see Di Sciullo and Williams (1987), Noyer (1991, 1994), Janda and Kathman (1992), Janda (1994, and references cited there). All of these irregularities are untypical of the syntactic component and would thus seem to favor an autonomous morphological treatment of derivation and inflection.

In part as a consequence of such difficulties, much current research adopts a lexical treatment of derivational and inflectional morphology, which after Chomsky (1993) has come to be known as the "Checking Theory."

Chomsky (1995, 195–196) compares two possible alternatives, explicitly opting for the second: (1) a bare stem, inserted from the lexicon, "picks up" the features of distinct inflectional heads and is subsequently spelled out in PF as a single phonological word; and (2) a lexical item, comprising inflectional features, is inserted from the lexicon with such features, checked against the corresponding features of the inflectional heads through which the item raises.

As noted by Beninca' (1999, 13), the second option "could be too weak, if not supplemented by an independent principle, which at least specifies, for example, in what order the matching of features has to occur" (see also Potter 1996). Perhaps, the essence of the Mirror Principle can be better maintained under Chomsky's first option if the checking of hierarchically arranged features follows the cycle, whereby no feature of an outer cycle can be checked before the feature of an inner cycle has been checked, and the relative brackets erased:

[ [ [ [α] infl1] infl2] . . . infl<sub>n</sub>]

If the features are then spelled out in PF, in a one-to-one fashion with morphemes, or many-to-one, or one-to-many, or if, in this spell-out, they are "tied to" a particular stem form, the irregularities mentioned earlier cease to be problematic. For example, one and the same morpheme (as in the syncretic case above) may "realize" two distinct features, checked in two separate heads (as long as such features are not separated by another which is spelled out as a distinct morpheme).<sup>8</sup>

A third source of evidence for functional structure is given by the nature and order of certain nonlexical specifiers—that is, specifiers other than those hosting argument DPs in the (layered) VP.

Rizzi (1997), for example, has proposed a particular articulation of the CP "space" for the positions of topic and focus phrases found in the left periphery of the sentence.<sup>9</sup> Cinque (1994, 1999) has argued that APs and AdvPs should be viewed as specifiers of the functional projections of the DP and the sentence, respectively, so that their nature and order should provide evidence for the nature and order of these projections independently of (and, it is to be expected, in convergence with) the nature and order of the corresponding head morphemes.<sup>10</sup>

A fourth type of evidence for functional structure (specifically, functional heads), which in principle should overlap with that coming from the nature and order of the bound and free morphemes referred to earlier, is based on the idea, explored in Cinque (2000), that "restructuring" verbs are functional verbs, directly merged into the corresponding functional heads (for some preliminary related discussion, see Cinque 2001a, 2002).

It is to be hoped that these different types of evidence for functional structure will be systematically investigated and made to interact to eventually attain the complete map (and sequencing) of the functional elements of natural language phrases and sentences. The chapters contained herein focus in particular on aspects of the fine structure of DPs and IPs. Much work remains to be done concerning the functional structure of APs, PPs, AdvPs, and other, minor, phrases (QPs, etc.).

## The Contributions

The functional structure of nominal phrases has been the focus of much research in the 1990s, and this research has proved to be quite rich and articulated. The contributions by Brugè (chapter 2), Giusti (chapter 3), and Scott (chapter 4) begin with such findings and go on to reach new and important insights in this domain. Brugè presents compelling evidence from a variety of languages for the conclusion that Demonstrative Phrases are "base generated" in the specifier of a functional projection lower than those hosting attributive Adjective Phrases and (immediately) higher than NP (or the projection hosting the subject PP and possessive adjective, if different from the highest NP layer). Even those languages that obligatorily raise the Demonstrative Phrase to higher specifier positions (such as Spec, DP) show traces of the original lower "base generation" position in the possibility of stranding in that position locative reinforcers, which ordinarily form a constituent with demonstratives. She also singles out a few (interacting) parameters thus deriving the quite substantial variation shown by languages in this domain.

Scott's chapter constitutes a fundamental step forward in the identification of the finer grained functional structure underlying the DP internal space of Attributive Adjective phrases in object nominals. He shows the existence of a quite substantial number of distinct classes of attributive adjectives, all rigidly ordered with respect to each other. He also carefully considers broader theoretical issues stemming from this finding and points to some of the factors that may obscure the rigid order of the APs.

Giusti's contribution proposes a very simple and elegant minimalist system of principles to derive the wide variation among languages in the expression of definiteness. In particular, she argues for the last resort nature of articles, categorially heads, and for the phrasal nature of the elements (among which are null operators, demonstratives, possessives, and remnant NPs) that carry the referential import of the DP, ultimately as occupants of Spec, DP.

The three contributions together attain a remarkable coverage of the various "spaces" of the functional structure of DPs, from the lowest (Brugè's), to the intermediate (Scott's), to the highest (Giusti's).

The remaining three contributions all deal with the internal articulation of the IP space of the sentence. Cardinaletti and Roberts's (chapter 5) article is an updated version of a paper originally presented at the 1990 GLOW conference in Cambridge. It is one of the earliest works that exploits the heuristic potential of abstract functional projections, achieving the unification of various X-second (especially, Verb-second and "Clitic-second") effects via the postulation of an additional Agr head between C

and AGRs. Having being widely circulated, and quoted, in its earlier unpublished form, it is hosted here (in revised form) as the first regular publication of their results.

Guasti and Rizzi's contribution (chapter 6) presents and discusses quite impressive evidence from early English (around the third year), pointing to the conclusion that the functional head where agreement is checked is below C, and higher than the position to where, in negative contexts, auxiliary *do* raises, crossing over negation (presumably T). Their work thus appears to give evidence for a head intermediate between T and C, where agreement is checked (whether or not this is an AGR head).

The contribution by Neidle and MacLaughlin (chapter 7) on American Sign Language (ASL) also gives evidence for positing agreement projections distinct from Tense. It is also of particular interest for the general issue of functional structure in that it provides evidence for its universality in language across modalities (spoken or signed) and for its universal hierarchical organization, with Tense higher than Aspect (functional information in ASL is marked nonmanually, with face and upper body, and runs parallel to manual signing).

Noteworthy (from Cinque's 1999 viewpoint) is also their observation that ASL has multiple aspect projections and that aspectual adverbs bear morphological inflections (movement modulations) that are of the same general kind as those found on verbs marked by the corresponding aspects.

## Notes

1. The project, originally conceived by Luigi Rizzi and myself, brings together different groups of researchers at the Universities of Ferrara, Florence, Milan, Padua, Siena, and Venice. It has been funded since 1998 (to 2004) by the Italian Ministry of the University and Scientific Research. Most of the articles included here were presented at the first meeting of the groups held in Venice in January 29 and 30, 1999.
2. Iatridou's (1990) arguments against positing such extra heads are not cogent for this particular case of lexical infinitives. See Pollock (1997, 3.1) for discussion.
3. Pollock (1989) conjectured that such a category could be taken to be an abstract AGR head because of the lack of lexical verb raising to such a head in English and because English differs from French in being poorer in verbal agreement. But his argument does not depend on the exact label of the head.
4. A similar generalization, called there the Satellite Principle, appears sketched in footnote 4 of chapter 4 of Gerds (1982, 1993), within a relational grammar framework.
5. See also Foley and Van Valin (1984), who, however, refer to a previous version of Bybee (1985).
6. This works for suffixes. While Baker's original discussion of the Mirror Principle applied to both prefixes and suffixes, much subsequent work (starting with Pollock 1989 and Belletti 1990) adopted a narrower interpretation, restricting attention to suffixes, which in "head-initial" languages systematically appear in an order that is the mirror image of the order of the corresponding free morphemes. This limitation is perhaps not accidental, nor is it undesirable, as prefixes appear to be a nonhomogeneous class (Cinque 1999, 68–70; see also Brody 2000, 34). Cinque's (1999) discussion should be integrated for the case of those Bantu languages where prefixes show the same order of the corresponding functional heads but must be adjacent to each other and to the verb (i.e., cannot cliticize onto anything except other functional morphemes or the verb). The fact that nothing can intervene between them can be made sense of if we assume attraction of the (remnant) VP to the Spec of the prefix, followed

by head movement of the prefix itself to a Kaynean W head). This further requires that the AdvP corresponding to the functional head in question be in the Spec of a "small extended projection" of the functional head.

7. Possibly of the same general type is the apparent double expression of tense in the Australian language Wambaya (Nordlinger 1995).

8. A more careful investigation along these lines may indeed show that no weakening of the Mirror Principle of the sorts proposed in Noyer (1991), Speas (1991), Potter (1996), Alsina (1999), and others is really necessary. For a recent attempt at deriving the generalization expressed by the Mirror Principle, see Brody (2000).

9. Also see Beninca' (2001), Beninca' and Poletto (1999) for an interesting proposal about the order of the focus phrase with respect to different (and differently specialized) topic positions. Their finding, together with Cinque's (2001b) that apparent multiple positionings of the same functional morpheme hide differently specialized functional heads, may suggest ruling out simple recursion from UG completely.

10. See also Scott (chapter 4, this volume).

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