

# FSEQ AND CARTOGRAPHY: THE TIP OF THE ICEBERG

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**Abstract:** The present paper is intended as an overview of some of the major issues in, and contributions to, Cartography. First, it discusses the general framework. Next, it describes some highly influential analyses and the conclusions that have been reached in the literature of the past few decades. Then, it compares Cartography to Nanosyntax. Finally, it presents some alternatives to this research program.

**Keywords:** fseq, Cartography, Nanosyntax, functional categories

## 1. Introduction

The present paper is a review article on the cartographic enterprise in syntax.<sup>1</sup> Consequently, it merely attempts to sum up the current state of understanding this line of research, it identifies researchers, and it discusses works within the area previously published by others. As such, it does not report new experimental results, it does not identify gaps in the research, and it does not evaluate the studies published so far. As far as the methodology is concerned, I focus on those aspects of the subject matter that I feel to be most representative of, and relevant to, Cartography and Nanosyntax, as well as on those aspects that I am most knowledgeable about. Naturally, these few pages cannot mention all the research previously written by others. So, readers should not consider these few pages even remotely complete about the topic, and those who wish to pursue things further are encouraged to track down the relevant sources. After all, what I intend to present here is only the tip of the iceberg.<sup>2</sup>

The aims of the paper are (i) to synthesize and organize the literature on this very generous topic, (ii) to identify one extension within the trend, and (iii) to discuss some alternatives to Cartography.

The paper is organized as follows: Section 2 offers an introduction to the cartographic framework. Section 3 identifies three hypotheses that serve as starting points for future cartographic analyses. Section 4 addresses the issue of the fine-grained decomposition of syntactic structures. Section 5 is concerned with Nanosyntax. Section 6 is devoted to alternatives to Cartography. Section 7 rounds off the paper with a short summary.

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<sup>1</sup> I developed an interest in Cartography while I was enrolled on a postgraduate programme in linguistics at the University of Geneva. Later, at the 2013 EGG summer school in Wrocław, Poland, I greatly benefited from several research classes and especially from fruitful discussions with Michal Starke, who explained to me some relevant aspects of Nanosyntax and drew my attention to the type of research done at the University of Tromsø/CASTL. I hereby would like to thank him for his help. All errors are, of course, mine.

<sup>2</sup> In fact, the literature on Cartography more generally and functional categories more specifically is so vast that I am afraid I say too much if I say that I can present the tip of this iceberg. Maybe it is better if I say that what I do here is scratch the surface of this iceberg hoping to give a taste of the flavour of fseq and Cartography.

## 2. The cartographic framework

Similarly to Minimalism, Cartography is not a theory so much as a program for research. Its locus is within the Principles and Parameters framework of syntactic theory. Its aim is to “draw maps as precise and detailed as possible of syntactic configurations” (Cinque and Rizzi 2008: 43), hence the name Cartography. To this end, comparing as many different languages as possible, it looks at functional categories in an attempt to figure out and determine their possible order in a universal hierarchy called the unique functional sequence (henceforth *fseq* for short). The emphasis is on the modifier here: universal is understood as meaning across all human languages. And this may not be much of a surprise, as the detailed structural maps drawn by cartographic studies do hold across languages. To use Cinque and Rizzi’s (2008: 46) words:

the cartographic approach assumes [...] that the distinct hierarchies of functional projections dominating VP, NP, AP, PP, IP, etc., may be universal in the type of heads and specifiers that they involve, in their number, and in their relative order, even if languages differ in the type of movements that they admit or in the extent to which they overtly realize each head and specifier.

To put it differently, according to the strongest position, if there is evidence for the existence of a certain functional head (and projection) in a certain language, then there is evidence for the existence of that particular head (and projection) in all other languages, but languages differ whether they offer overt evidence for it or not. The basic idea lying behind the approach is that a given syntactic structure is the same in all languages even if in some languages there is no morphological evidence for the existence of a certain feature. This is explicitly formulated in Kayne (2005: 16):

while it is logically possible that the absence of an overt functional element in language A corresponding to a functional element visible in language B could indicate that language A entirely lacks that functional element, there is a substantial tradition that has profitably taken the opposite position – namely, that if language B visibly has some functional element, then all languages must have it, even if in some or many it fails to be pronounced at all.

From this perspective, for instance, the argument for the existence of the category of AgrOP – responsible for object agreement and Accusative case checking – and the direct evidence for its existence from languages with overt object agreement morphology can be restated in terms of the existence of this functional category more generally in all languages, even in those ones which do not show direct evidence for its existence. Hence, the hypothesis that is put forth is that whenever some language manifests evidence for the existence of AgrOP (or any particular XP), then this category must be present in all other languages even in those ones in which it has no morphological manifestation. If this is correct, variation between languages cannot be expressed in terms of the absence or presence of a relevant functional category. As discussed in Cinque and Rizzi (2008), this hypothesis might turn out to be wrong, but it is the strongest hypothesis possible and

therefore the one that should be pursued until evidence is found to the contrary. This leads us to the working hypothesis of the cartographic framework, namely that “all languages share the same principles of phrase and clause composition and the same functional make-up of the clause and its phrases” (Cinque and Rizzi 2008: 45–46), and this holds across languages.

The number of morphemes that constitute a given expression indicates the number of heads present in the underlying syntactic structure. This idea is closely connected with Kayne’s (2005) suggestion that each and every morphosyntactic and semantic feature should correspond to an independent syntactic head in the functional sequence. This is also a principle adopted in the Cartographic framework, where authors are guided by the maxim of one (morphosyntactic) property – one feature – one head. Thus, it is assumed that whenever we are able to identify a morpheme which adds a given property (or meaning) to the expression it is part of, this indicates that the underlying syntactic structure contains an independent head corresponding to that property (and meaning). In a similar way, whenever we see two independent morphemes in a given expression, this indicates the existence of two different heads in the syntactic structure, corresponding to each of the two morphemes.

Given that studies of one single language or even a few languages, no matter how deep they are, fail to reveal the richness of the functional/grammatical structure of UG owing to the fact that although all languages share the same underlying skeleton, certain functional categories can be (and are often) silent in certain languages, the natural questions that I ask here are then the following: Can we have a rough estimate of the total number of functional features? Would it be possible to come up with a universal inventory of functional elements/features? How precise can the relative order of the different functional projections be? Can we really combine the partial orders overtly manifested by different languages into a unique functional order imposed by UG? This would require taking into account as many languages as possible, for though many functional elements not occurring overtly in one language are indeed visible in other languages. Kayne (2005) asks the same questions and concludes that as far as the number of functional features is concerned, one hundred would be a low estimate. Based on Heine and Kuteva’s (2002) study on the world lexicon of grammaticalization, Cinque and Rizzi (2008) assume that if the number of independent grammaticalization targets is somewhere around four hundred, then, in view of the above-mentioned maxim, the number of functional elements cannot be less than that.

Cartography, pursued intensely at some universities and research centres in Italy, Switzerland, Belgium, the Netherlands, and other countries, is accessible to the general public through the nine volumes of the Oxford University Press series entitled *The Cartography of Syntactic Structures*. These are the following: Cinque (2002), Rizzi (2004a), Belletti (2004b), Cinque (2006), Benincà and Munaro (2010), Cinque and Rizzi (2010), Brugè et al. (2012), Haegeman (2012), and Svenonius (2014). Furthermore, special mention should be made of some (recent) monographs and edited volumes of the John Benjamins Publishing Company, *Linguistik Aktuell/Linguistics Today* series; cf. Endo (2007), Durrleman-Tame (2008), Asbury et al. (2008), Biloa (2013), Bocci (2013), and others. These monographs and the large number of papers included in these volumes prove that this research topic is gaining more and more attention and interest.







The previous section of the paper centred around three major hypotheses formulated at the advent of what later comes to be known as Cartography. As we witness, with the widespread adoption of X-bar Theory, the introduction of different (functional) categories is made possible, as this theory more generally and Kayne's (1984) Binary Branching Hypothesis more specifically constrain only the specifier-head-complement form of syntactic structures, but not the number and content of heads and categories. That is, nothing prevents syntacticians from identifying and introducing new functional heads, which are then included in the universal functional hierarchy. In the present section, I present the richly articulated functional domain of different phrasal and clausal structures.

#### 4.1 Nouns and pronouns

First, I turn to the cartography of nominal structures. This sub-section is built on the DP Hypothesis introduced in the previous section: it starts with a discussion of what the head of nominal arguments is and it includes an enumeration of possible functional projections in the decomposition of DPs.

Whereas the oldest tradition both inside and outside generative grammar is that nouns head nominal constituents, starting with Abney (1987) the determiner plays a more prominent role in the internal structure of nominals. Needless to say, a number of advantages follow from this pioneering proposal. Due to space limitations, I will not go into details here. Suffice it to say that this proposal, besides unifying the treatment of noun phrases and clauses, increases the number of structural positions (for instance, specifier positions) that can host different elements associated with the noun and even adjunction phenomena, it nicely accounts for different syntactic and semantic phenomena, it explains both prenominal and pronominal used pronouns in an elegant way, and it accounts for the complementary distribution of determiners and possessives.<sup>4</sup>

First and foremost, Ritter's (1991) contribution to the internal structure of nominals consists in the proposal of a functional projection corresponding to the noun's singular/plural marking. In particular, she proposes that NumP, not NP, is the complement of D, at least in Modern Hebrew.

But comparative work on the structure of NPs reveals that in many languages NPs are associated with numerous functional features. In this respect, Valois (1991), Cinque (1993, 1994), Szabolcsi (1994), Longobardi (1994), among many others, show the relevance of the postulation of various functional categories internal to nominal (or rather determiner) phrases. Some of the proposals made for DP-internal functional projections correspond to gender (GenderP/GenP), case (KP, with separate KP-nom, KP-dat, KP-acc, etc.), person (PersonP/PersP, with a fine-grained distinction between Person1P, Person2P, Person3P, and Reflexive3P; or even a distinction between deictic and non-deictic persons, or hearer and speaker features), quantifier (QP), different categories to account for scope ambiguity among quantified DPs (DistP stands for distributive quantifier phrase, ShareP is used for the quantifier of distributed share, CountP is the label for counting quantifier

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<sup>4</sup> Although possessors are in complementary distribution with determiners in English, they freely co-occur in other languages like Hungarian; cf. Szabolcsi (1983, 1987).

phrase, RefP is for referential phrase, and so on), demonstrative (DemP), classifier (ClfP/ClAP), agreement (AgrP, with a further distinction between AgrOP, AgrGenP, AgrPossP, AgrP<sup>n</sup>, etc.), possession (PossP), word markers (WMP), definiteness (DefP), specificity (SpP), diminutive/augmentative/endeared/pejorative morpheme (DimP/AugP/EndearP/PejP respectively), contrast (KonP), voice (VoiceP), aspect (AspP), tense (TP), to mention only a few. An interesting category, called applicative, is where clitics are generated (ApplP), but we also encounter influential works where clitics head their own functional projection called Clitic Phrase (CIP). What is more, if ditransitive structures are analyzed in terms of *v*P-VP verb shells (where one shell is headed by the light verb and the other is headed by the contentful/lexical verb; cf. above), there are reasons to believe that this analysis of ditransitive structures can be extended to nominalizations like *John's donation of money to the church*; cf. Adger (2003) for a general presentation of little *n* or *n*P.

The increasingly articulated functional structure of DPs leads many syntacticians to conclude that DP is parallel not only to IP, but also to an embedded CP; cf. Alexiadou et al. (2007) for a review of the literature of the last 20 years.

For excellent summaries of the literature on DPs and their internal structure, cf. especially Ouhalla (1991), Zamparelli (1995), Bernstein (2001) for a general overview, Longobardi (2001), Part I in Cinque (2002) and the reference cited there, Coene and D'Hulst (2003a, b) and especially the Introduction in the two volumes, the principal lines of the development of DP sketched in Part I and II in Alexiadou et al. (2007), but see also Brugè et al. (2012) for some relevant papers, and Alexiadou (2014).

#### 4.2 Verbs and their inflection

Inflection is actually a cover term for a more articulated cartographic structure. Naturally, the Split-IP Hypothesis brings several debates over the correct order of the two newly-introduced functional nodes. Pollock (1989) assumes that tense is the higher inflectional head and it *c*-commands verbal Agr sandwiched between T and V. Belletti (1990) argues equally strongly for the sequence AgrP > TP > VP. Much of the motivation for this proposal derives from Baker's (1985) Mirror Principle, according to which the order of affixes reflects the syntactic hierarchical structure. Hence, for Ouhalla (1991), the question is not which order is the correct one, but what kind of languages display the Agr-inside-T and the Agr-outside-T order. A solution is proposed by Chomsky (1991, 1993), who claims that there are two Agr heads: one above T associated with subject agreement (hence AgrSP) and one below T associated with object agreement (hence AgrOP).<sup>5</sup> <sup>6</sup> Later, Chomsky himself admits that "it seems reasonable to conjecture that Agr does not exist" (Chomsky 1995: 377). A brief history and a general overview of Agr are given in Belletti (2001).

<sup>5</sup> In the current literature, we also find AgrIO corresponding to indirect object agreement.

<sup>6</sup> In Hungarian, there is a further difference between definite and indefinite object agreement. This triggers different inflections in the verb.

Pollock's (1989) paper has a profound impact on future syntactic decompositions. Not only does his Split-IP Hypothesis find an echo in many subsequent proposals, but the newly-decomposed IP is put again under the knife and split into further smaller and smaller parts. As far as some other projections put forth for the traditional VP are concerned, they are briefly presented in what follows.

First, the functional category of mood is argued to be distinct both from T and Agr, and it should be the head of MoodP, with proposals for further modal distinctions associated with [+past] or between, say, the [+realis] and [-realis] opposition; cf. Pollock (1997) and endnote 36.

Then, based on the evidence that modals are neither part of Infl nor base-generated inside VP, it is only natural to conclude that they also constitute an independent class of syntactic categories, they head their own maximal projection (ModP), and they project their own X-bar structure.

Also, serious proposals have been made for what is widely known as aspectual projection (AspP); see Ouhalla (1990) and Travis (1991), or even Cinque (1999, 2001). One important consequence of the existence of this projection, situated between *v*P and VP, is a domain of aspectual interpretation: only elements within the domain of aspectual interpretation can contribute to the aspectual interpretation of the predicate. Furthermore, the aspectual auxiliaries (perfect *have* and progressive *be*) can select either the aspectual PerfP or the aspectual ProgP, licensing perfect and progressive verb forms respectively. The hierarchy of projections is roughly the following: TP > PerfP > ProgP > *v*P > VP.

A number of facts related to the order of the passive morpheme, as well as the structural and thematic properties of passive constructions (i.e. the thematic subject is not and cannot become the structural subject) can be explained once the Pass morpheme is assigned a categorial status in the sense of X-bar Theory.

The proliferation of heads and projections leads to other verb-related functional categories such as PartP (standing for a participle phrase), GerP (standing for Gerundial Phrase), VoiceP (assisting in the formation of the passive), and others. What is more, in addition to AgrP and TP, two other subject-related functional categories are introduced: SubjP hosts subject-of-predication arguments and EPPP hosts arguments that satisfy the EPP.

Different verb types receive different treatment. As such, following recent studies on spatial PPs, Lam (2012) proposes a cartographic decomposition of motion verbs and even suggests a tentative parallelism between the two domains. The motion verb root MOVE generates at the bottom of the universal structure consisting of the following functional sequence: ModP > AspP > ... > DirP > DeicP > ResP > OriP > MannP.

The main idea that just as a complex event may be broken up into a series of sub-events, VP also breaks up into sub-VPs is put forth in Ramchand (2008). The event structure syntax contains three subevental components: the causing subevent (initP/*v*P), which introduces the causation event and licenses the INITIATOR; the process-denoting subevent (procP/VP), which specifies the nature of the process and licenses the UNDERGOER; and the result subevent (resP/RP), which gives the result state of the event and licenses the RESULTEE. A complex event maximally includes these subevental components ordered in a particular hierarchical relation (*v*P > VP > RP), with the arguments/role types as specifiers of particular functional projections.

### 4.3 Negation

In view of the conclusions reached to split the Infl node into individual syntactic categories, I should dedicate a separate subsection to negation.

We have seen that works on several (lexical) parts of the clause have revealed evidence for different functional projections. Negation, that is Neg, is not an exception to this as, alongside the detailed studies on the functional structure of different lexical categories, its structure has gained considerable interest in the past couple of decades.

It may seem now that there is a general consensus that negation is an independent syntactic category and it heads its own maximal projection (NegP), but it is not hard to find proposals or approaches where negation is in some non-head position (e.g. in specifier or adjunction position), or different negative elements (e.g. French *ne* and *pas*) are in different X-bar theoretic positions. And things are not straightforward even if we assume that the Neg head is situated between I and V, and it prevents I from merging with the verb, as I no longer stands for a simple inflection and we are faced with a wide range of possibilities as far as the hierarchical order of categories is concerned. Ouhalla (1991) resorts, again, to parametric variation when explaining that languages differ as to where they place the Neg element in the verbal complex and how negation is realized lexically (i.e. as the specifier of Neg, the head of NegP, or maybe both).

Some proposals put forth in the literature argue that there are two different kinds of negation: (i) the lower predicate negation, which scopes over VP, and (ii) the higher negation position, which is associated with the propositional polarity. In this respect, instead of saying that there is no NegP in a sentence like *John said nothing*, what is proposed is that English has a specific functional projection which is underspecified for the feature [NEG] (i.e. it is underdetermined for either NEG or POS) and the projection encodes the polarity of the sentence. This projection, dominated by Agr and dominating T, is labelled, among others, SigmaP/ΣP (Laka 1990) or PolP (Culicover 1991).

Following the earlier version of Cinque's (1999) proposal on both the structure of the clause and the content of the functional projections hosting the adverbs relevant for the distribution of negative markers, Zanuttini (1997, 2001) addresses the question whether there can be more than one NegP in a single clause (differing in distribution and their contribution to the interpretation of the clause). The answer turns out to be affirmative and she proposes the following hierarchy:

- (5) NegP-1 > TP-1 > NegP-2 > TP-2 > NegP-3 > ... > NegP-4  
(Zanuttini 1997: 101; Zanuttini 2001: 532)

In compliance with the tenets of Cartography, although this diagram is based on the study of negative markers in Romance languages and Romance varieties spoken in northern Italy, on the assumption that (this) fseq is made available by UG to all languages, individual languages will differ depending on which projection(s) they instantiate.

Interested readers are referred to Ouhalla (1991) for some general assumptions, and Laka (1990), Haegeman (1995), Zanuttini (1997, 2001), and De Clercq (2013) for specific problems and issues related to negation.

#### 4.4 Adjectives and adverbs

In this rapid pace of changes, those who believe that adjectives and adjectival phrases are not subject to a fine-grained decomposition are very much mistaken. As in the 70s and 80s the basic idea is that adverbs and adjectives are contextual variants of the same abstract category, it is proposed that APs should be treated in exactly the same way as adverbs, i.e. APs should be divided into a number of different subcategories on the basis of their interpretation and assigned to fixed positions. Surprisingly, A has been compared to N as well: Abney (1987) notices that AP has a specifier system that parallels the specifier system of NP in many ways and it is as rich as (if not even richer than) this latter one. The adjective phrase is then analyzed as a projection of degree (Deg) element (cf. Corver 1991), which allows us to accommodate the variety of adjectival specifiers. Deg selects AP in the same way D selects NP, and it can host a quantitative degree phrase (QP), a measure degree phrase (MP), or an adverbial degree phrase (ADVP).

Corver (1997) further argues on the basis of Dutch data that there is reason to assume a separate QP between DegP and AP, since the two functional elements can actually co-occur in an extended AP like *20 cm too high*. A structure like DegP > QP > AP accommodates the different elements that we can find in the extended adjectival projection, and makes the category of adjectives similar to other lexical categories in that it has its own category-specific functional projections.

Moreover, not only are adjectives (expressing size, length, height, speed, age, shape, colour, temperature, origin, material, purpose, etc.) subject to ordering restrictions, but we also know that subject-oriented APs preceding the noun can be preceded by speaker-oriented APs, in their turn followed by an agentive adjective or an adjective denoting manner. Moreover, adjectives can be used attributively and/or predicatively. Also, there is a long-standing debate in the literature about their position: they are either adjoined to a maximal projection or they are generated in distinct specifier positions of a functional projection between D and N. Obviously, the latter analysis leads to the postulation of a higher number of functional projections between D and N.

What we illustrate below is Scott's (2002: 114) proposed universal hierarchy of AP-related functional projections:

- (6) Determiner > Ordinal Number > Cardinal Number > Subjective Comment > ?Evidential > Size > Length > Height > Speed > ?Depth > Width > Weight > Temperature > ? Wetness > Age > Shape > Colour > Nationality/Origin > Material > Compound Element > NP

For modification relations inside DP, their type, sequencing, and syntax, cf. Cinque (1993, 1994, 2010), Laenzlinger (2000), the relevant sections in Bernstein (2001) and especially Scott (2002), Part III in Alexiadou et al. (2007), Svenonius (2008), or in fact all the papers collected in the volume edited by McNally and Kennedy (2008).

As far as adverbs are concerned, they make important semantic contributions to the clause they appear in, but they are often treated as optional and their semantics is not well understood. More significantly, there are two major camps concerning their status: adjuncts or independent heads. Only two years after Rizzi's (1997) seminal paper (see

below), a very influential work (Cinque 1999) presents the functional categories associated with various types of adverbials, their content and meaning, their number, and, more importantly, their relative order. The ideas are sustained by a wealth of examples taken from a wide variety of languages. Each adverb class enters into a specifier–head relation with a functional head, and the hierarchy established by the adverb phrases is claimed to be responsible for the variability of structural positions and the scopal properties demonstrated by different adverb classes.

The universal and rigid hierarchical order that Cinque suggests in his seminal work is illustrated below. For a slightly modified version, cf. Pesetsky (2000) and Shlonsky (2010); for a more detailed analysis of AspP, see also Cinque (2001).

- (7) [*frankly* Mood *speech act*  
 [*fortunately* Mood *evaluative*  
 [*allegedly* Mood *evidential*  
 [*probably* Mod *epistemic*  
 [*once* T(Past)  
 [*then* T(Future)  
 [*perhaps* Mood *irrealis*  
 [*necessarily* Mod *necessity*  
 [*possibly* Mod *possibility*  
 [*usually* Asp *habitual*  
 [*again* Asp *repetitive(I)*  
 [*often* Asp *frequentative(I)*  
 [*intentionally* Mod *volitional*  
 [*quickly* Asp *celerative(I)*  
 [*already* T(Anterior)  
 [*no longer* Asp *terminative*  
 [*still* Asp *continuative*  
 [*always* Asp *perfect(?)*  
 [*just* Asp *retrospective*  
 [*soon* Asp *proximative*  
 [*briefly* Asp *durative*  
 [*characteristically (?)* Asp *generic/progressive*  
 [*almost* Asp *prospective*  
 [*completely* Asp *SgCompletive(I)*  
 [*tutto* Asp *PlCompletive*  
 [*well* Voice  
 [*fast/early* Asp *celerative(II)*  
 [*again* Asp *repetitive(II)*  
 [*often* Asp *frequentative(II)*  
 [*completely* Asp *SgCompletive(II)*  
 verb

(Cinque 1999: 106)

Cinque (1999) argues for the strongest hypothesis to typological variation: not only do all languages have the same inventory of functional projections, but their relative ordering is also the same. But languages vary in terms of which categories are realized adverbially and which are realized in terms of an inflectional head.

I do not think I exaggerate if I say that this is by far the most detailed and best argued attempt to spell out in detail the functional projections of adverbial clauses. Those who are interested in (the cartography of) adverbs should definitely start with this fascinating book and then they may continue with Laenzlinger (1996, 2002) or Alexiadou (1997), and complete their list of must-read books with the titles given in the references there.

#### 4.5 Prepositions, postpositions, and particles

Jackendoff (1973) complains that prepositions do not receive the attention they deserve, and they are a highly neglected category. It is hard to estimate whether this might be related to their intermediate – both lexical and functional – and hence indeterminate status. Although it is still true that more attention has been (and is) paid to nouns, verbs, adjectives, or adverbs; it is equally true that by now a considerable amount of research has been dedicated to the structure of PPs.

Jackendoff (1983), dealing with the semantics of spatial prepositions, breaks the ice with his distinction between Path and Place, and a further fine-grained distinction between various Path categories in the conceptual structure such as GOAL, ROUTE, and VIA PATHS. His argument for the necessity to distinguish between them is based on conceptual reasons, different selectional restrictions on the two groups of PPs, and the existence of some languages that show systematic differences in their place- and path-denoting PPs. When they are simultaneously realized, PathP projected by Path is always structurally higher than PlaceP projected by Place.

Jackendoff (1983) has an enormous impact on future approaches to the study of PP. It is mirrored in more recent papers (Van Riemsdijk and Huijbregts 2007, Koopman 2010, den Dikken 2010, Svenonius 2010, etc.), which all augment the structure of PP considerably and even if they introduce slightly different terminology such as LocP and DirP, they still keep the semantically motivated classes of PLACE and PATH, and claim that the basic hypothesis that they are different functional projections is still valid.

If earlier studies focus on the binary division of PPs into PathP and PlaceP, recent advances show a more richly articulated functional domain and include further functional layers. Schweikert's (2005: 120) cartographic hierarchy is outlined below:

- (8) Evidential > Future Temporal/Past Temporal/Source Temporal-1/Temporal > Source Temporal-3 > Locative > Source Temporal-2 > Duration Temporal-3 > Comitative > Benefactive > Reason > Source > Duration Temporal-2 > Duration Temporal-1 > Goal > Malefactive > Instrumental/Means > Instrumental/Path > Matter > Manner

Interestingly, when it comes to the category P, most of the data come from Dutch. Therefore, as one of the best studied languages in matter of PPs is Dutch, several of the

analyses rely on the generalizations established for this language. Hence, those interested in PPs should go back at least to Van Riemsdijk (1978).

There have been various proposals concerning the internal syntax of PPs, and the syntactic/semantic roles they have in the clause. For more detailed analyses, see Zwarts (1997), the articles in Svenonius and Pantcheva (2006) and Bašić et al. (2007), the doctoral dissertations in Asbury (2008), Gehrke (2008), Romeu (2014), all the papers in Asbury et al. (2008), Cinque and Rizzi (2010), but see also Pantcheva (2011), and others.

Due to the well-known assumption that English particles are in fact intransitive prepositions, probably it would be important to stay with the PP domain a little longer and say a few words about particles. Van Riemsdijk (1990) considers them to be the heads of the functional projection *p*P, the extended projection of the lexical PP, from which position they can move and incorporate into the verb. He argues that the functional projection labelled *p*P is on top of the lexical PP and accounts for the structure of German circumpositional phrases. Svenonius (2003, 2010) also uses this label for the projection that introduces the Figure argument in its specifier. In this sense, if we take *p*P to license the external argument of PP, we may notice its parallelism to *v*P, which licenses the external argument of VP (the literature sometimes talks about the Split P Hypothesis). Svenonius (2003) introduces the *p* projection as an adopted label from Van Riemsdijk (1990) and claims that particles occupy the *p* head. Ramchand and Svenonius (2002) assume a separate PrtP as the base position of particles. Irrespective of the terminology, particles seem to occupy a separate head projecting its own maximal projection.

#### 4.6 The CP field

It is only one little step from here to generalize functional categories in the clausal domain as well. And indeed, proposals related to the CP domain equally involve extended projections. At the beginning of the 1990s, the idea that there is a rich system of functional heads gives rise to much research and we have difficulties keeping up with the fast growing literature. For instance, Rizzi's (1997) work on the fine structure of the left periphery (giving rise to what is frequently called the Split CP Hypothesis) inspires many syntactic cartographers to explore information structure in this domain, with focus on how many and in what order functional categories are projected between CP and IP. According to this account, the rightmost (i.e. the most deeply embedded) functional head represent finiteness, which is not tense, but has temporal properties. The leftmost functional head is a category that represents illocutionary force; that is, it shows whether the sentence is declarative, interrogative, or imperative. Between these two, we find three positions directly tied to the information structure of the clause. In the very middle, there is a focus position, which is associated with new information in the clause. This is situated between two positions associated with old information or topic. The structure proposed in this paper is given below, where the asterisk indicates recursion:

(9) ForceP > \*TopP > FocP > \*TopP > FinP > IP

(Rizzi 1997: 297)

Whereas nothing blocks the recursion of TopP, recursion of FocP is more constrained. The focal element is in [Spec, FocP], and the complement of this head is called presupposition. Similarly, the topic element is in [Spec, TopP] (the DP *this book* in (11)) and its complement is called comment. Therefore, topicalization is the articulation of topic and comment. Sentence (10) is illustrated below in (11):

(10) This book<sub>i</sub>, I think I will read t<sub>i</sub> tomorrow.

(11)

	...	TopP		
			3	
	DP	Top'		
		4	3	
this book	Top		CP/Comment	
			3	
		DP	...	

(Rizzi 1997: 286)

Rizzi (2001) revises this analysis and argues for the existence of a unique functional projection connected with the interrogative force of the clause (IntP), that is located between ForceP and FocP, and it may be sandwiched between TopP projections. This gives rise to the slightly modified hierarchy given below, where, again, the asterisk indicates recursion:

(12) ForceP > \*TopP > IntP > \*TopP > FocP > \*TopP > FinP > IP

(Rizzi 2001: 289)

The C system is even further expanded and includes many other functional projections or even different left dislocated elements such as Scene Setting Phrase (SceneSettingP), Left Dislocation Phrase (LDP), Aboutness-Shift Topic Phrase (AShift TP), Referential Topic Phrase (Ref TP), Contrastive Topic Phrase (Contr TP), Familiar Topic Phrase (Fam TP), Hanging Topic Phrase (HTP), Informational Focus Phrase (Inf FP), Contrastive Focus Phrase (Cont FP) and many, many others. Among the numerous studies that embrace this idea and explore the architecture of the CP field, we find É. Kiss (1998, 2008), Poletto (2000), Rizzi (2004b), Sigurðsson (2004), Lohnstein and Trissler (2004), Benincà (2001, 2006), Frascarelli (2007), Frascarelli and Hinterhölzl (2007), Frascarelli and Puglielli (2007), and Bocci (2013), but see also the contributions in Rizzi (2004a), Molnár and Winkler (2006), Zimmermann and Féry (2010), and Benincà and Munaro (2010). Although not all of these studies are based on English (e.g. Poletto 2000 is an investigation of the syntax of the upper portion of the functional sentence structure of more than one hundred Northern Italian dialects), interested readers should at least scan through these studies to see the set of functional projections which is claimed to be the same in the languages or dialects examined, all the more so because of the basic hypothesis of Cartography that all languages have the same sequence of functional projections even if in some languages some categories are not overtly expressed.

#### 4.7 Functional categories at the syntax–semantics and syntax–pragmatics interface

The semantic information and the pragmatic force of a sentence and the pragmatic roles of discourse participants have been considered to be peripheral to the syntactic component of grammar. Recently, however, there have been numerous proposals for syntactic projections that encode information relevant to the interface between syntax and semantics, on the one hand, and syntax and pragmatics, on the other hand (the roots are in Rizzi 1997, Cinque 1999, and all the subsequent studies that grew out of these two influential works, see above). I do not address the question about the extent to which semantic and/or pragmatic information is (or should be) syntactically represented, all I aim here is to enumerate some of the projections from the (probably infinite?) inventory of functional projections at the syntax–semantics and syntax–pragmatics interface.

Linguistic utterances may have a particular syntactic form concerning the communicative value they convey. Well-known philosophers of language such as John Searle or John Austin consider that an understanding of syntactic facts requires an understanding of their function in communication. Indeed, recently, much work has been developed showing that discourse is syntactically encoded in Split CP and that functional projections in the CP domain are capable of encoding discursive values. Chomsky himself considers that if we adopt a left-periphery approach, then the moved element has to reach the right position in the left periphery for interpretation. Proof of this is the birth of such projections as AssertiveP/AssP (which expresses the Speaker's attitude or, in other words, it projects whenever confirmative features associated to the Speaker's attitude must be checked) or EvaluativeP/EvalP (which accounts for evaluations made by the Speaker). For detailed accounts, cf. Ambar (2003) and others.

Speas and Tenny (2003) operate with two types of Speech Act Phrases (see also Cinque 1999), abbreviated as SAP and SA\*P, which host such P(ragmatic)-roles as SPEAKER, UTTERANCE, CONTENT, and HEARER in their specifier or complement positions. Then, they argue for point of view phenomena in terms of a layered sentence phrase (SenP and Sen\*P), configurationally defining the P-roles SEAT OF KNOWLEDGE and EVIDENCE. With some hesitation, they take SenP to be a unification of the more familiar Evaluation Phrase (EvalP), and Sen\*P to be a unification of Evidential Phrase (EvidP), for which one may consult Cinque (1999).

That the categories of speech act, specifically Speaker and Addressee, are conceptually necessary for an adequate syntactic account of different sentence types – such as declarative, interrogative, imperative, optative, exclamatory, etc. – is further sustained by another novel syntactic projection, namely Zanuttini's (2008) Jussive Phrase, which captures the thematic property (Addressee) of the grammatical subject of core imperatives.

Moreover, if we take into account that politeness is syntactically manifested, albeit differently in languages like Korean/Japanese, on the one hand, and English, on the other hand, we should not be surprised to find several studies claiming that honorifics is the head of the functional projection HonP, with serious debates over the location where the [ $\pm$ Hon] feature is checked in the two languages families.

#### 4.8 Non-finite clauses and predication

There has been a tremendous amount of discussion in the generative literature regarding the syntactic representation of non-finite clauses, such as different ECM constructions and small clauses, which have thus received various treatments. Although most approaches assign them a parallel structure, most of the discussions focus on their internal structure and the exact categorial status of the small clause node: lexical vs. functional. Stowell (1981, 1983) takes small clauses to be the maximal projections of their predicative element, that is, XP, where X can be any lexical category, and the subject of the small clause is the specifier of XP. Kitagawa (1985) considers that the head of the predicate is not the head of the clause, but small clauses contain an INFL node, where the phonetically null copula is referred to as *be*. For Hornstein and Lightfoot (1987), small clauses are built on INFL marked [ $\pm$  TENSE]. Haegeman (1994) and Guéron and Hoekstra (1995) believe that small clauses are best analysed as projections of a functional head representing (adjectival) agreement (AgrP). Legendre (1997) explores the idea that small clauses are gender phrases marked GenP (at least in French). Bowers (1993, 1997) proposes that every form of subject–predicate relation – both the predicative relations found in main clauses (see above) and the ones found in small clauses – reduces to the functional head Pr, the head of a maximal projection called PrP. And this idea that there is a designated predicative (and functional) head and phrase has been influential since Bowers' analysis. Starke (1995), however, argues for their C<sup>0</sup> status. In den Dikken (2006), all predication relationships are mediated by a functional head called Relator, which projects RelP/RP. Different kinds of functional (and only functional) elements can be Relators, so this is an abstract functional head, a placeholder for any functional head that mediates a predication relation between two terms. In this respect, the head can be a copula, a PP, a T, or any head that relates a predicate to its subject.

Naturally, the predication relation between the subject and the predicate of different small clauses is mediated by different (functional) heads: in resultatives, for instance, *res* projecting RP not only mediates the predication relation between the subject and the XP predicate, but also encodes the meaning of result or become; cf. Ramchand (2008), but see also Hasegawa (2000), where the independent result predicate projection is called VrP. However, in depictives the depictive phrase is decomposed into an adjective and a depictive head (DepP) that temporally links the state denoted by the adjective to an event; cf. Pylkkänen (2008).

For an excellent overview of predication more generally and secondary predication constructions more specifically, see den Dikken (2006) and the reference cited there.

#### 4.9 Conjunctions and disjunctions

The proposal that conjunction is the head of a phrase, more exactly the head of the conjunction phrase (i.e. Boolean Phrase (BP), &P, Coordination Phrase (CoP), Conjunction Phrase (ConjP)), should not surprise us at all. It has been explored by too many linguists to enumerate them here. Suffice it to say that the analyses vary as to whether conjuncts can be specifiers and complements in a &P with recursive complements, or specifiers and complements in a &P with recursive specifiers, or maybe

they can be attached by adjunction. The various approaches to the syntax of coordination are presented in Progovac (2003), with the twelve-page list of references at the end of the article giving enough bibliography to interested readers.

Disjunctive phrases have received an equally diverse treatment, especially as far as their location of projection is concerned. But most agree that a disjunctive element or particle occurs as the head of DisjP.

#### 4.10 Intermediate summary

In the present section, I have taken a close look at the fast growing literature on (some) functional projections and their sequence. I have tried to group them according to the main (phrasal) category to which they belong. Obviously, there is a significant number of topics that I have not even attempted to mention here. Most of them are related to the syntax–semantics and syntax–pragmatics interface.

### 5. A further development of Cartography: Nanosyntax

Nanosyntax, which proposes to rethink syntactic theory and the architecture of language in light of the empirical results of the last 30 years of work in the Principles and Parameters tradition, is a recent but extremely powerful and, I would say, influential development in formal syntax. It is generally viewed as a further development of Cartography; more precisely, it is the cartographic approach to syntax pursued primarily by nanosyntacticians from the University of Tromsø/CASTL (Center for Advanced Study in Theoretical Linguistics). Its aim is to go beyond lexical items/words and even morphemes in order to identify the smallest building blocks of sentences. As its distinguishing feature is that it is in search of the smallest syntactic terminals, there is an explanation for the “nano” part in the name of the framework.

Nanosyntax follows the basic idea of Cartography: whenever we are able to isolate a morpheme that adds a given meaning to the expression it is part of, this is an indication that the underlying syntactic structure contains an independent head corresponding to that meaning. In fact, each terminal node represents a single feature and these features are ordered in a universal hierarchy or sequence called *fseq*. Nanosyntax is thus built on the radical implementation of the cartographic approach to language and follows its maxim of one morphosyntactic property – one feature – one head; cf. also Section 2. More concretely, it assumes that all individual features project their own structural layers and combine into binary branching trees.

It takes as its starting point the idea that the larger the syntactic trees grow as a result of fine-grained decompositions, the smaller the terminal nodes become and at some point they even become smaller than a morpheme; cf. Starke (2009).<sup>7</sup> This means that

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<sup>7</sup> If earlier directions turned their attention from lexical categories to functional categories, the “flesh and blood of grammar” (Ouhalla 1991: 1), and investigated the role of the latter in determining language variation, more recent directions consider that lexical categories all reduce to functional features, that is, everything is functional and nothing can be considered lexical any more (p.c., Michal Starke).

what Nanosyntax assumes is that terminals in the syntactic representations are not lexical items (i.e. words or morphemes), but as they are even smaller than individual morphemes, they are sub-morphemic. This is in sharp contrast to the mainstream view that morphemes are inserted into terminal nodes. For ease of understanding, take a look at the example given in Starke (2011): the French *chantait* and *chanta* both express past tense, but they differ in their aspectual properties (the first is imperfective and the second is perfective). We also know that tense (T) and aspect (Asp) are different syntactic projections. Now, in Nanosyntactic terms, this does not mean that *-ait* spells out T and co-occurs with a null imperfective morpheme in Asp, and *-a* spells out T but co-occurs with a null perfective morpheme in Asp; but this is interpreted as showing that, for instance, features for both T and Asp are packaged into the morpheme *-a* in *entra*, which spells out the phrasal constituent T > Asp. In compliance with fseq, the features T and Asp are merged in this particular order. In fact, there is evidence from the vast literature for this specific order: in languages which realize aspect and tense agglutinatively, the Asp morpheme is always closer to the stem than the T morpheme, or, in other words, T is always higher in the hierarchy than Asp. Furthermore, Nanosyntax assumes that in the lexicon there is a vocabulary item which pairs the phonological form /a/ with the syntactic structure [T [Asp]]. When this structure is built in syntax, it can be lexicalized by the morpheme *-a*, since the syntactic and lexically stored structures match.

One basic hallmark of Nanosyntax, a direct consequence of the above-mentioned starting point, is that it assumes that a single morpheme can lexicalize syntactic structures with multiple terminals. That is, morphemes and words are no longer the spellout of a single terminal, rather, a single morpheme spans several syntactic terminals, and therefore corresponds to an entire syntactic phrase or a subtree rather than to a terminal. This, in its turn, leads to a mismatch between the number of terminals and the number of morphemes. This means that there is no one-to-one correspondence between the number of morphemes that constitute a given expression and the number of terminals in its underlying syntactic structure. Nanosyntax adopts the so-called Phrasal Spell-out model, which allows for a single morpheme to lexicalize multiple syntactic terminals.

If I understand this approach correctly, the way syntactic trees are built in this model is not in a top-down way, where words are decomposed into smaller and smaller morphemes, but rather in a bottom-up way. In this model, grammar starts from atomic features, and puts them together into large and fine-grained syntactic structures. These structures are translated into phonological and conceptual representation via lexical access.<sup>8</sup> But what results from here is that there is no lexicon prior to syntax, there is no lexicon feeding syntax, syntax does not project from the lexicon, but it rather creates or builds lexical items by putting together trees which constitute lexical items. That is, syntax is a pre-lexical system and the lexicon is a way of interpreting syntax (and mapping it onto other representations such as conceptual representations and phonological representations).

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<sup>8</sup> According to Starke (2009), lexical entries are minimally of the form <phonological information, syntactic tree, conceptual information>, and Spell out becomes an operation that matches the tree constructed by syntax to the (sub-)trees stored inside lexical entries.

What is interesting is that in Nanosyntax sub-morphemic features are combined in the same way as phrases and sentences: syntactic trees are built by Merge from individual atomic features. And this approach has implications for the architecture of grammar. If correct, it shows that the same principles which govern the composition of phrases in sentences govern the composition of features in morphemes.

Some of the theory-internal principles of this model of Cartography – such as the Superset Principle together with the Identification principle, the Cyclic Override, the Exhaustive Lexicalization Principle, and the Elsewhere Principle/Condition – allow for an elegant and powerful theory of morpho-syntax, syncretism, and generally of the syntax–lexicon correspondence.

That much work has been done so far about various new avenues opened by Nanosyntax is proved by the large number of doctoral schools, winter and summer (EGG) schools, lecture series, linguistic seminars, and research projects dedicated to this development in formal syntax. Most of them are organized and conducted by faculty members of the University of Tromsø/CASTL and of Ghent University, but also of other universities<sup>9</sup>. The very serious research undertaken at the above-mentioned research centre and universities has been materialized in several doctoral dissertations as well; see Jabłońska (2007) on argument structure, Lundquist (2008) on nominalizations and participles in Swedish, Muriungi (2008) on Bantu verbs, Caha (2009) on case hierarchy, Pantcheva (2011) on prepositions and verbal prefixes/particles, Dékány (2011) on Hungarian noun phrases and their fseq, but see also Rocquet (2013) on direct object marking, De Clercq (2013) on negation, Romeu (2014) on spatial constructions, and many others that I cannot mention for reasons of space limitations. Other significant studies and articles include Fábregas (2007, 2010), Ramchand (2008), Taraldsen (2010), Romeu (2013), inter alia. Interested readers are also referred to the papers in Svenonius et al. (2009), all dedicated to Nanosyntax, or they can visit the website set up for this direction of research (<http://nanosyntax.auf.net/whatis.html>).

## 6. Alternatives to Cartography

The title of this section of the paper is borrowed from an excellent volume edited by Van Craenenbroeck (2009b). But before discussing the main ideas of this volume, let us take a look at some other issues.

Naturally, based on what I have presented so far, one alternative view on grammar would take syntactic trees to be as small and as simple as possible. Obviously, in several cases there is empirical evidence for the existence of a particular functional projection in a particular sentence, e.g. due to the presence of an overt functional head. Accordingly, a certain functional projection would be present only in cases when there is direct evidence for its existence, or, in other words, its presence in a sentence and/or in a given language would not automatically imply its presence in all sentences and/or all languages.

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<sup>9</sup> At the 47<sup>th</sup> Annual Meeting of *Societas Linguistica Europaea* (SLE 2014) in Poznań, Poland, a thematic workshop will be dedicated to the advantages and consequences of the nanosyntactic approach to language (“Nanosyntax. How going fine-grained enables a better understanding of language”), where all the conveners are from Ghent University.

Inevitably, Cartography and its complexity has been compared to Minimalism and its simplicity. As far as this point is concerned, there seems to be no consensus whatsoever among researchers. In this sense, whereas some argue that the two approaches are perfectly compatible as the former is an extension of the latter and they represent a division of labour; others consider that there is a serious tension and contradiction between them, and the two are incompatible. We do not address this issue here, but interested readers are referred to Belletti (2004a), Cinque and Rizzi (2008), and Shlonsky (2010) for a more integrated approach to the two research programs, or even to the interview given by Noam Chomsky to Adriana Belletti and Luigi Rizzi in Chomsky (2002); cf. especially Chapter 4. What is important here is that, as emphasized in Shlonsky (2010: 427):

Cartography is not an *alternative* to Minimalism. On the contrary, the feature-driven approach to syntax, the reliance on simple operations such as Merge, Project and Search pave the way to a research program whose goal is to draw up a precise inventory of features and discover their structural relations.

In what follows, then, we turn to some real alternatives to Cartography. The era of late Minimalism witnesses further proliferation of ideas including some interesting alternatives to cartography-based solutions. Van Craenenbroeck (2009a), for instance, discusses some challenges for Cartography such as: (i) the universal functional sequence, its basic tenet, leads to word-order paradoxes and cannot explain cases where certain projections can occur in a wide variety of structural positions; (ii) it faces problems when it relies on Kayne's (1994) Linear Correspondence Axiom; and (iii) it cannot account for cases when the movement of a certain phrase X has interpretative effects on another phrase Y not directly involved in the movement operation.

Furthermore, as the need for a theory of the limits on (at least four hundred or maybe even more) functional projections becomes pressing, some serious attempts are made to reduce the number of functional heads. The author presents two main lines of alternatives to Cartography. The first reduces them either (i) by claiming that only some morphosyntactic (and semantic) features project their own functional projections, whereas others are grouped together on a single functional head and do not project on their own, or (ii) by simply rethinking the way movement works. The second seeks alternatives for the idea that all word order differences between languages arise from a universal base order combined with different movement operations.

I would recommend all the papers in Van Craenenbroeck (2009b) and the list of references at the end of each of them, but interested readers should by all means scan through at least Neeleman et al. (2009), Bouchard (2009), and, of course, Williams (2009), which is entitled "There is no alternative to Cartography". Whether we can or we cannot talk about alternatives to Cartography, whether functional sequence has an existence and importance that is independent of its direct role in structure building and that cannot be derived from other principles or components of the grammar are issues that we do not address here.

## 7. Final summary

In the present paper, I have tried to offer a general overview of the cartographic and nanosyntactic approaches to the architecture of grammar together with the most important stages or milestones in their development. In doing so, I have mentioned some works which are situated somewhere at the tip of the cartographic iceberg and whose influence is hard to underestimate. I can summarize this article in the following way: in the past 20–25 years, cartographic research has led to a real explosion of functional categories and heads. It would not be an exaggeration to say that every (lexical) phrase – NP, VP, AP, AdvP, PP, and CP – has been decomposed into multiple layers. More interestingly, not only do the detailed cross-linguistic comparisons argue that the hierarchy of functional projections is very fine-grained, but this hierarchy also seems to show no variation across languages (i.e. it also shows to be universal). This rigid sequence of functional projections is called the functional sequence or fseq.

Fortunately for syntactic studies more generally, but unfortunately for the present review article, the amount of work on clause structure and functional projections done over the last 20–25 years is so staggering that I have not addressed many questions and there is a significant number of topics that I did not even attempt to cover here. Research activity on this topic is currently expanding greatly, almost every new issue of the top linguistic journals brings with it some new insight into the issues discussed here. In spite of their superficiality, I hope that these few pages have managed to give a taste of the flavour of fseq and Cartography.

## References

- Abney, S. P. 1987. *The English Noun Phrase in its Sentential Aspect*. PhD dissertation, MIT.
- Adger, D. 2003. *Core Syntax. A Minimalist Approach*. Oxford: Oxford University Press.
- Alexiadou, A. 1997. *Adverb Placement: A Case-Study in Antisymmetric Syntax*. Amsterdam/Philadelphia: John Benjamins.
- Alexiadou, A. 2014. *Multiple Determiners and the Structure of DPs*. Amsterdam/Philadelphia: John Benjamins.
- Alexiadou, A., Haegeman, L., Stavrou, M. 2007. *Noun Phrase in the Generative Perspective*. Berlin · New York: Mouton de Gruyter.
- Ambar, M. 2003. Wh-asymmetries. In A. M. di Sciullo (ed.), *Asymmetry in Grammar. Syntax and Semantics*, vol. 1, 209-249. Amsterdam/Philadelphia: John Benjamins.
- Asbury, A. 2008. *The Morphosyntax of Case and Adpositions*. Utrecht: LOT Publications.
- Asbury, A., Dotlačil, J., Gehrke, B., Nouwen, R. (eds.). 2008. *Syntax and Semantics of Spatial P*. Amsterdam/Philadelphia: John Benjamins.
- Baker, M. 1985. The Mirror Principle and Morphosyntactic Explanation. *Linguistic Inquiry* 16: 373-415.
- Bašić, M., Pantcheva, M., Son, M., Svenonius, P. (eds.). 2007. *Tromsø Working Papers on Language and Linguistics: Nordlyd* 34 (2), Special Issue on Space, Motion and Result.
- Belletti, A. 1990. *Generalized Verb Movement: Aspects of Verb Syntax*. Torino: Rosenberg and Sellier.
- Belletti, A. 2001. Agreement Projections. In M. Baltin and C. Collins (eds.), *The Handbook of Contemporary Linguistic Theory*, 483-510. Malden, MA: Blackwell Publishers.
- Belletti, A. 2004a. Introduction. In A. Belletti (ed.), *Structures and Beyond: The Cartography of Syntactic Structures*, vol. 3, 3-14. Oxford: Oxford University Press.
- Belletti, A. (ed.). 2004b. *Structures and Beyond: The Cartography of Syntactic Structures*, vol. 3. Oxford: Oxford University Press.

- Benincà, P. 2001. The position of Topic and Focus in the Left Periphery. In G. Cinque and G. Salvi (eds.), *Current Studies in Italian Syntax. Essays Offered to Lorenzo Renzi*, 39-64. Amsterdam: Elsevier.
- Benincà, P. 2006. A detailed map of the Left Periphery of Medieval Romance. In R. Zanuttini, H. Campos, E. Herburger and P. Portner (eds.), *Crosslinguistic Research in Syntax and Semantics: Negation, Tense and Clausal Architecture*, 53-86. Washington, DC: Georgetown University Press.
- Benincà, P., Munaro, N. (eds.). 2010. *Mapping the Left Periphery: The Cartography of Syntactic Structures*, vol. 5 Oxford: Oxford University Press.
- Bernstein, J. 2001. The DP Hypothesis: Identifying clausal properties in the nominal domain. In M. Baltin and C. Collins (eds.), *The Handbook of Contemporary Linguistic Theory*, 536-561. Malden, MA: Blackwell Publishers.
- Biloa, E. 2013. *The Syntax of Tuki. A Cartographic Approach*. Amsterdam/Philadelphia: John Benjamins.
- Bocci, G. 2013. *The Syntax-Prosody Interface. A Cartographic Perspective with Evidence from Italian*. Amsterdam/Philadelphia: John Benjamins.
- Bouchard, D. 2009. A solution to the conceptual problem of Cartography. In J. van Craenenbroeck (ed.), *Alternatives to Cartography*, 245-274. Berlin · New York: Mouton de Gruyter.
- Bowers, J. 1993. The syntax of predication. *Linguistic Inquiry* 24: 591-656.
- Bowers, J. 1997. A binary analysis of resultatives. In R. C. Blight and M. J. Moosally (eds.), *Proceedings of the 1997 Texas Linguistics Society Conference*, 43-58. Austin: The University of Texas at Austin.
- Brugè, L., Cardinaletti, A., Giusti, G., Munaro, N., Poletto, C. (eds.). 2012. *Functional Heads: The Cartography of Syntactic Structures*, vol. 7. Oxford: Oxford University Press.
- Caha, P. 2009. The Nanosyntax of Case. PhD dissertation, University of Tromsø.
- Carnie, A. 2010. *Constituent Structure*, second edition. Oxford: Oxford University Press.
- Chomsky, N. 1970. Remarks on nominalization. In R. Jacobs and P. Rosenbaum (eds.), *Readings in English Transformational Grammar*, 184-221. Waltham, MA: Ginn and Company.
- Chomsky, N. 1986. *Barriers*. Cambridge, MA: The MIT Press.
- Chomsky, N. 1991. Some notes on economy of derivation and representation. In R. Freidin (ed.), *Principles and Parameters in Comparative Grammar*, 417-454. Cambridge, MA: The MIT Press.
- Chomsky, N. 1993. A minimalist program for linguistic theory. In K. Hale and S. J. Keyser (eds.), *The View from Building 20. Essays in Linguistics in Honor of Sylvain Bromberger*, 1-49. Cambridge, MA: The MIT Press.
- Chomsky, N. 1995. *The Minimalist Program*. Cambridge, MA: The MIT Press.
- Chomsky, N. 2002. *On Nature and Language*. Cambridge: Cambridge University Press.
- Cinque, G. 1993. On the evidence for partial N-movement in the Romance DP. *University of Venice Working Papers in Linguistics* 3 (2): 21-40.
- Cinque, G. 1994. On the evidence for partial N-movement in the Romance DP. In G. Cinque, J. Koster, J.-Y. Pollock, L. Rizzi and R. Zanuttini (eds.), *Paths towards Universal Grammar. Studies in Honor of Richard S. Kayne*, 85-110. Georgetown: Georgetown University Press.
- Cinque, G. 1999. *Adverbs and Functional Heads. A Cross-Linguistic Perspective*. New York, Oxford: Oxford University Press.
- Cinque, G. 2001. "Restructuring" and the order of aspectual and root modal heads. In G. Cinque and G. Salvi (eds.), *Current Studies in Italian Syntax. Essays Offered to Lorenzo Renzi*, 137-155. Amsterdam: Elsevier.
- Cinque, G. (ed.). 2002. *Functional Structure in DP and IP: The Cartography of Syntactic Structures*, vol.1. Oxford: Oxford University Press.
- Cinque, G. (ed.). 2006. *Restructuring and Functional Heads: The Cartography of Syntactic Structures*, vol. 4. Oxford: Oxford University Press.
- Cinque, G. 2010. *The Syntax of Adjectives. A Comparative Study*. Cambridge, MA: The MIT Press.
- Cinque, G., Rizzi, L. 2008. The Cartography of syntactic structures. In V. Moscati (ed.), *CISCL Working Papers on Language and Cognition* 2: 43-59.
- Cinque, G., Rizzi, L. (eds.). 2010. *Mapping Spatial PPs: The Cartography of Syntactic Structures*, vol. 6. Oxford: Oxford University Press.
- Coene, M., D'Hulst, Y. (eds.). 2003a. *From NP to DP. The Syntax and Semantics of Noun Phrases*, vol. 1. Amsterdam/Philadelphia: John Benjamins.
- Coene, M., D'Hulst, Y. (eds.). 2003b. *From NP to DP. The Expression of Possession in Noun Phrases*, vol. 2. Amsterdam/Philadelphia: John Benjamins.

- Collins, C. 1997. *Local Economy*. Cambridge, MA: The MIT Press.
- Corver, N. 1991. Evidence for DegP. In T. Sherer (ed.), *Proceedings of the 21st Annual Meeting of the North East Linguistic Society*, 33-47. Amherst: University of Massachusetts.
- Corver, N. 1997. The internal syntax of the Dutch extended adjectival projection. *Natural Language and Linguistic Theory* 15: 289-368.
- van Craenenbroeck, J. 2009a. Alternatives to Cartography: An introduction. In J. van Craenenbroeck (ed.), *Alternatives to Cartography*, 1-14. Berlin · New York: Mouton de Gruyter.
- van Craenenbroeck, J. (ed.). 2009b. *Alternatives to Cartography*. Berlin/New York: Mouton de Gruyter.
- Culicover, P. 1991. Topicalization, inversion and complementizers in English. In D. Delfitto, M. Everaert, A. Evers and F. Stuurman (eds.), *OTS Working Papers. Going Romance and Beyond*, 1-45. Utrecht: University of Utrecht.
- De Clercq, K. 2013. A Unified Syntax of Negation. PhD dissertation, Ghent University.
- Dékány, É. 2011. A Profile of the Hungarian DP: The Interaction of Lexicalization, Agreement and Linearization with the Functional Sequence. PhD dissertation, University of Tromsø.
- Dikken, M. den. 2006. *Relators and Linkers. The Syntax of Predication, Predicate Inversion, and Copulas*. Cambridge, MA: The MIT Press.
- Dikken, M. den. 2010. On the functional structure of locative and directional PPs. In G. Cinque and L. Rizzi (eds.), *Mapping Spatial PPs: The Cartography of Syntactic Structures*, vol. 6, 74-126. Oxford: Oxford University Press.
- Durlleman-Tame, S. 2008. *The Syntax of Jamaican Creole. A Cartographic Perspective*. Amsterdam/Philadelphia: John Benjamins.
- É. Kiss, K. 1998. Identificational focus versus information focus. *Language* 74: 245-273.
- É. Kiss, K. 2008. Topic and Focus: Two structural positions associated with logical functions in the Left Periphery of the Hungarian sentence. *Acta Linguistica Hungarica* 55: 287-296.
- Endo, Y. 2007. *Locality and Information Structure. A Cartographic Approach to Japanese*. Amsterdam/Philadelphia: John Benjamins.
- Fábregas, A. 2007. The exhaustive lexicalization account of directional complements. In M. Bašić, M. Pantcheva, M. Son and P. Svenonius (eds.), *Tromsø Working Papers on Language and Linguistics: Nordlyd* 34 (2): 165-199.
- Fábregas, A. 2010. A syntactic account of affix rivalry in Spanish nominalizations. In A. Alexiadou and M. Rathert (eds.), *The Syntax of Nominalizations across Languages and Frameworks*, 67-91. Berlin · New York: Mouton de Gruyter.
- Frascarelli, M. 2007. Subjects, topics and the interpretation of referential pro. An interface approach to the linking of (null) pronouns. *Natural Language and Linguistic Theory* 25: 691-734.
- Frascarelli, M., Hinterhölzl, R. 2007. Types of topics in German and Italian. In S. Winkler and K. Schwabe (eds.), *On Information Structure, Meaning and Form*, 87-116. Amsterdam/Philadelphia: John Benjamins.
- Frascarelli, M., Puglielli, A. 2007. Focus in the Force-Fin system. Information structure in Cushitic languages. In E. Aboh, K. Hartmann and M. Zimmermann (eds.), *Focus Strategies in African Languages. The Interaction of Focus and Grammar in Niger-Congo and Afro-Asiatic*, 161-184. Berlin · New York: Mouton de Gruyter.
- Gehrke, B. 2008. *Ps in Motion. On the Semantics and Syntax of P Elements and Motion Events*. Utrecht: LOT Publications.
- Guéron, J., Hoekstra, T. 1995. The temporal interpretation of predication. In A. Cardinaletti and M. T. Guasti (eds.), *Syntax and Semantics*, vol. 28. *Small Clauses*, 77-107. New York: Academic Press.
- Haegeman, L. 1994. *Introduction to Government and Binding Theory*, second edition. Oxford: Blackwell Publishers.
- Haegeman, L. 1995. *The Syntax of Negation*. Cambridge: Cambridge University Press.
- Haegeman, L. 2012. *Adverbial Clauses, Main Clause Phenomena, and the Composition of the Left Periphery: The Cartography of Syntactic Structures*, vol. 8. Oxford: Oxford University Press.
- Hasegawa, N. 2000. Resultatives and language variation: Result phrases and VV compounds. *Japanese/Korean Linguistics* 9: 269-282.
- Heine, B., Kuteva, T. 2002. *World Lexicon of Grammaticalization*. Cambridge: Cambridge University Press.
- Hoekstra, T. 2000. The function of functional categories. In L. Cheng and R. Sybesma (eds.), *The First GLOT International State-of-the-Article Book*, 1-25. Berlin · New York: Mouton de Gruyter.

- Hornstein, N., Lightfoot, D. 1987. Predication and PRO. *Language* 63: 23-52.
- Jabłońska, P. 2007. Radical Decomposition and Argument Structure. PhD dissertation, University of Tromsø.
- Jackendoff, R. 1973. The base rules for prepositional phrases. In S. R. Anderson and P. Kiparsky (eds.), *A Festschrift for Morris Halle*, 345-356. New York: Holt, Rinehart and Winston.
- Jackendoff, R. 1983. *Semantics and Cognition*. Cambridge, MA: The MIT Press.
- Johnson, K. 1991. Object positions. *Natural Language and Linguistic Theory* 9: 577-636.
- Kayne, R. 1984. *Connectedness and Binary Branching*. Dordrecht: Foris Publications.
- Kayne, R. 1994. *The Antisymmetry of Syntax*. Cambridge, MA: The MIT Press.
- Kayne, R. 2005. Some notes on comparative syntax, with special reference to English and French. In G. Cinque and R. Kayne (eds.), *The Oxford Handbook of Comparative Syntax*, 3-69. Oxford: Oxford University Press.
- Kitagawa, Y. 1985. Small but clausal. In W. H. Eilfort, P. D. Kroeber and K. L. Peterson (eds.), *Papers from the 21st Regional Meeting of the Chicago Linguistic Society*, 210-220. Chicago: University of Chicago.
- Koopman, H. 2010. Prepositions, postpositions, circumpositions, and particles. The structure of Dutch PPs. In G. Cinque and L. Rizzi (eds.), *Mapping Spatial PPs: The Cartography of Syntactic Structures*, vol. 6, 26-73. Oxford: Oxford University Press.
- Kratzer, A. 1996. Severing the external argument from its verb. In J. Rooryck and L. Zaring (eds.), *Phrase Structure and the Lexicon*, 109-137. Dordrecht: Kluwer Academic Publishers.
- Laenzlinger, C. 1996. Comparative Studies in Word-Order Variations: Adverbs, Pronouns, and Clause Structure in Romance and Germanic. PhD dissertation, University of Geneva.
- Laenzlinger, C. 2000. French adjective ordering: Perspectives on DP-internal movement types. *Generative Grammar in Geneva* 1: 55-104.
- Laenzlinger, C. 2002. A feature-based theory of adverb syntax. *Generative Grammar in Geneva* 3: 67-105.
- Laka, I. 1990. Negation in Syntax: On the Nature of Functional Categories and Projections. PhD dissertation, MIT.
- Lam, C.-F. 2012. The parallelism between motion VPs and spatial PPs. Paper presented at the 18<sup>th</sup> International Conference of Korean Linguistics (ICKL 2012), 5-8 July 2012 School of Linguistic Sciences, Jiangsu Normal University.
- Larson, R. 1988. On the double object construction. *Linguistic Inquiry* 19: 335-391.
- Legendre, G. 1997. Secondary predication and functional projections in French. *Natural Language and Linguistic Theory* 15: 43-87.
- Lohnstein, H., Trissler, S. 2004. *The Syntax and Semantics of the Left Periphery*. Berlin · New York: Mouton de Gruyter.
- Longobardi, G. 1994. Reference and proper names: A theory of N-movement in syntax and Logical Form. *Linguistic Inquiry* 25: 609-665.
- Longobardi, G. 2001. The structure of DPs: Some principles, parameters, and Problems. In M. Baltin and C. Collins (eds.), *The Handbook of Contemporary Linguistic Theory*, 562-603. Malden, MA: Blackwell Publishers.
- Lundquist, B. 2008. Nominalizations and Participles in Swedish. PhD dissertation, University of Tromsø.
- McNally, L., Kennedy, C. (eds.). 2008. *Adjectives and Adverbs. Syntax, Semantics, and Discourse*. Oxford: Oxford University Press.
- Molnár, V., Winkler, S. (eds.). 2006. *The Architecture of Focus*. Berlin · New York: Mouton de Gruyter.
- Muriungi, P. 2008. Phrasal movement inside Bantu verbs: Deriving affix scope and order in Kĩtharaka. PhD dissertation, University of Tromsø.
- Neeleman, A., Titov, E., Koot, H. van de, Vermeulen, R. 2009. A syntactic typology of topic, focus and contrast. In J. van Craenenbroeck (ed.), *Alternatives to Cartography*, 15-51. Berlin · New York: Mouton de Gruyter.
- Ouhalla, J. 1990. Sentential negation, Relativised Minimality and the aspectual status of auxiliaries. *The Linguistic Review* 7: 183-231.
- Ouhalla, J. 1991. *Functional Categories and Parametric Variation*. London: Routledge.
- Pantcheva, M. 2011. Decomposing Path. The Nanosyntax of Directional Expressions. PhD dissertation, University of Tromsø.
- Pesetsky, D. 2000. The battle for language: From syntax to phonics. Handout for a talk in a USC series on Language and Mind. Available at [http://web.mit.edu/linguistics/people/faculty/pesetsky/USC\\_talk.pdf](http://web.mit.edu/linguistics/people/faculty/pesetsky/USC_talk.pdf).

- Poletto, C. 2000. *The Higher Functional Field. Evidence from Northern Italian Dialects*. Oxford: Oxford University Press.
- Pollock, J.-Y. 1989. Verb movement, Universal Grammar, and the structure of IP. *Linguistic Inquiry* 20: 365-424.
- Pollock, J.-Y. 1997. Notes on clause structure. In L. Haegeman (ed.), *Elements of English Grammar. Handbook in Generative Syntax*, 237-279. Dordrecht: Kluwer Academic Publishers.
- Progovac, L. 2003. Structure for coordination. In L. Cheng and R. Sybesma (eds.), *The Second GLOT International State-of-the-Article Book*, 241-287. Berlin · New York: Mouton de Gruyter.
- Pylkkänen, L. 2008. *Introducing Arguments*. Cambridge, MA: The MIT Press.
- Ramchand, G. 2008. *Verb Meaning and the Lexicon. A First-Phase Syntax*. Cambridge: Cambridge University Press.
- Ramchand, G., Svenonius, P. 2002. The lexical syntax and lexical semantics of the verb-particle construction. In L. Mikkelsen and C. Potts (eds.), *Proceedings of the 21st West Coast Conference on Formal Linguistics*, 387-400. Somerville, MA: Cascadia Press.
- van Riemsdijk, H. 1978. *A Case Study in Syntactic Markedness. The Binding Nature of Prepositional Phrases*. Lisse: The Peter de Ridder Press.
- van Riemsdijk, H. 1990. Functional prepositions. In H. Pinkster and I. Genee (eds.), *Unity in Diversity: Papers Presented to Simon C. Dik on his 50th Birthday*, 229-241. Dordrecht: Foris Publications.
- Riemsdijk, H. Van, Huijbregts, R. 2007. Location and locality. In S. Karimi, V. Samiian and W. K. Wilkins (eds.), *Phrasal and Clausal Architecture. Syntactic Derivation and Interpretation. In Honor of Joseph E.monds*, 339-364. Amsterdam/Philadelphia: John Benjamins.
- Ritter, E. 1991. Two functional categories in noun phrases: Evidence from Modern Hebrew. In S. Rothstein (ed.), *Syntax and Semantics*, vol. 25. *Perspectives on Phrase Structure: Heads and Licensing*, 37-62. San Diego: Academic Press.
- Rizzi, L. 1997. The fine structure of the Left Periphery. In L. Haegeman (ed.), *Elements of English Grammar. Handbook in Generative Syntax*, 281-337. Dordrecht: Kluwer Academic Publishers.
- Rizzi, L. 2001. On the position "Int(errogative)" in the Left Periphery of the clause. In G. Cinque and G. Salvi (eds.), *Current Studies in Italian Syntax. Essays Offered to Lorenzo Renzi*, 287-296. Amsterdam: Elsevier.
- Rizzi, L. (ed.). 2004a. *The Structure of CP and IP: The Cartography of Syntactic Structures*, vol. 2. Oxford: Oxford University Press.
- Rizzi, L. 2004b. Locality and the Left Periphery. In A. Belletti (ed.), *Structures and Beyond: The Cartography of Syntactic Structures*, vol. 3, 223-251. Oxford: Oxford University Press.
- Rocquet, A. 2013. *Splitting Objects. A Nanosyntactic Account of Direct Object Marking*. PhD dissertation, Ghent University.
- Romeu, J. 2013. *The Nanosyntax of Path*. Paper presented at the 23<sup>rd</sup> Colloquium on Generative Grammar (CGG 23), Complutense University of Madrid. Available at <http://ling.auf.net/lingbuzz/001798>.
- Romeu, J. 2014. *Cartografía Mínima de las Construcciones Espaciales*. PhD dissertation, Complutense University of Madrid.
- Schweikert, W. 2005. *The Order of Prepositional Phrases in the Structure of the Clause*. Amsterdam/Philadelphia: John Benjamins.
- Scott, G.-J. 2002. Stacked adjectival modification and the structure of nominal phrases. In G. Cinque (ed.), *Functional Structure in DP and IP: The Cartography of Syntactic Structures*, vol. 1, 91-120. Oxford: Oxford University Press.
- Shlonsky, U. 2010. The cartographic enterprise in syntax. *Language and Linguistics Compass* 4: 417-429.
- Sigurðsson, H. Á. 2004. The syntax of person, tense and speech features. *Rivista di Linguistica* 16: 219-251.
- Speas, P., Tenny, C. 2003. Configurational properties of point of view roles. In A. M. di Sciullo (ed.), *Asymmetry in Grammar. Syntax and Semantics*, vol. 1, 315-344. Amsterdam/Philadelphia: John Benjamins.
- Starke, M. 1995. On the format of small clauses. In A. Cardinaletti and M. T. Guasti (eds.), *Syntax and Semantics*, vol. 28, *Small Clauses*, 237-269. New York: Academic Press.
- Starke, M. 2009. Nanosyntax. A short primer to a new approach to language. In P. Svenonius, G. Ramchand, M. Starke and K. T. Taraldsen (eds.), *Tromsø Working Papers on Language and Linguistics: Nordlyd* 36 (1): 1-6.

- Starke, M. 2011. Towards an elegant solution to language variation: Variation reduces to the size of lexically stored trees. Transcript of a presentation at the Barcelona Workshop on “Linguistic Variation in the Minimalist Framework”. Available at <http://ling.auf.net/lingbuzz/001183>.
- Stowell, T. 1981. *Origins of Phrase Structure*. Cambridge, MA: The MIT Press.
- Stowell, T. 1983. Subjects across categories. *The Linguistic Review* 2: 285-312.
- Svenonius, P. 2003. Limits on P: Filling in holes vs. falling in holes. In A. Dahl, K. Bentzen and P. Svenonius (eds.), *Tromsø Working Papers on Language and Linguistics: Nordlyd* 31 (2): 431-445.
- Svenonius, P. 2008. The position of adjectives and other phrasal modifiers in the decomposition of DP. In L. McNally and C. Kennedy (eds.), *Adjectives and Adverbs. Syntax, Semantics, and Discourse*, 16-42. Oxford: Oxford University Press.
- Svenonius, P. 2010. Spatial P in English. In G. Cinque and L. Rizzi (eds.), *Mapping Spatial PPs: The Cartography of Syntactic Structures*, vol. 6, 127-160. Oxford: Oxford University Press.
- Svenonius, P. (ed.). 2014. *Functional Structure from Top to Toe: The Cartography of Syntactic Structures*, vol. 9. Oxford: Oxford University Press.
- Svenonius, P., Pantcheva, M. (eds.). 2006. *Tromsø Working Papers on Language and Linguistics: Nordlyd* 33 (1/2), Special Issues on Adpositions.
- Svenonius, P., Ramchand, G., Starke, M., Taraldsen, K. T. (eds.). 2009. *Tromsø Working Papers on Language and Linguistics: Nordlyd* 36 (1), Special Issue on Nanosyntax.
- Szabolcsi, A. 1983. The possessor that ran away from home. *The Linguistic Review* 3: 89-102.
- Szabolcsi, A. 1987. Functional categories in the noun phrase. In I. Kenesei (ed.), *Approaches to Hungarian 2: Theories and Analyses*, 167-189. Szeged: JATE.
- Szabolcsi, A. 1994. The noun phrase. In F. Kiefer and K. É. Kiss (eds.), *Syntax and Semantic*, vol. 27, *The Syntactic Structure of Hungarian*, 179-274. New York: Academic Press.
- Taraldsen, K. T. 2010. The Nanosyntax of Nguni noun class prefixes and concords. *Lingua* 120: 1522-1548.
- Travis, L. 1991. Derived objects, inner aspect, and the structure of VP. Paper presented at the 22nd Annual Meeting of the North East Linguistic Society, University of Delaware.
- Valois, D. 1991. The Internal Syntax of DPs. PhD dissertation, UCLA.
- Williams, E. 2009. There is no alternative to Cartography. In J. van Craenenbroeck (ed.), *Alternatives to Cartography*, 361-373. Berlin · New York: Mouton de Gruyter.
- Zamparelli, R. 1995. Layers in the Determiner Phrase. PhD dissertation, University of Rochester.
- Zanuttini, R. 1997. *Negation and Clausal Structure. A Comparative Study of Romance Languages*. Oxford: Oxford University Press.
- Zanuttini, R. 2001. Sentential negation. In M. Baltin and C. Collins (eds.), *The Handbook of Contemporary Linguistic Theory*, 511-535. Malden, MA: Blackwell Publishers.
- Zanuttini, R. 2008. Encoding the addressee in the syntax: Evidence from English imperative subjects. *Natural Language and Linguistic Theory* 26: 185-218.
- Zimmermann, M., Féry, C. (eds.). 2010. *Information Structure. Theoretical, Typological, and Experimental Perspectives*. Oxford: Oxford University Press.
- Zwarts, J. 1997. Vectors as relative positions: A compositional semantics of modified PPs. *Journal of Semantics* 14: 57-86.

### Online sources

<http://nanosyntax.auf.net/whatis.html>.



