

The Cartographic Project of the Generative Enterprise – An interview with Guglielmo Cinque*

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Cartography, a fine-grained articulation of syntactic structures, accounts for an intensive development of the splitting tradition that aims to capture the rich empirical facts observed in cross-linguistic studies. Thus, it has the theoretical linguistic circle pondering its conceptual necessity in the current linguistic framework. Unfolding from the inception of cartography to its prospects, this interview represents a relatively overall scrutiny of both theoretical and technical details of cartography. The real purpose of the interview is to reveal the relation between cartography and the Minimalist Program (MP) on the one hand, and the contributions of cartography to MP on the other. For the former, the interview first introduces the motivations of cartography and Cinque's strong position in the methodology of cartography, and then compares the architectural differences between MP, Greenberg's typological studies, and cartography. More importantly, the different foci of cartographic maximization of syntactic structure (maximalism) and minimalist minimization of redundancies (minimalism) are expounded, which facilitates demonstration of the compatibility, rather than contradiction, between these two research programs. For the latter aspect, the interview explains the flexible proposal of cartography towards morphology, and then primarily elucidates the different opinions of these two programs regarding parametrization of functional and substantive universals in the lexicon, which paves the way for the interview to illustrate cartographic views about L1 and L2 acquisition. In addition, some potential challenges cartography faces are touched upon, along with its prospects. The interview ends with a brief analysis of two theoretical puzzles initiated by cartography.

Key words: architecture, cartography, feature, maximalism, the Minimalist Program

1. Introduction

For the past two decades or so, cartography has attracted considerable attention in generative linguistic circles, and various comments, positive or not, have appeared one after another. In order to clarify its contributions to the generative enterprise and respond to some potential challenges it faces, an interview with Guglielmo Cinque (Professor of Linguistics, University of Venice) was conducted during the 6th International Conference on Formal Linguistics in Conjunction with the International Conference on Language Acquisition, Language Disorder and Language Assessment

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(ICFL-2014, Tsinghua University, November 8–9, 2014) by Tiaoyuan Mao (hereinafter “Mao”) and Fanjun Meng (hereinafter “Meng”). The interview was mainly concerned with the motivations, structural architecture, certain challenges and prospects of cartography – most importantly, the relation between cartography and the Minimalist Program (MP). Based on a thorough examination of cartography, the interview aims to call increased attention from linguists, particularly Chinese linguists, to this practical means of studying syntactic structures, and verify the contributions of cartography to the enrichment of MP.

2. Motivations of cartography

Meng: Professor Cinque, we are honored to conduct this interview with you regarding the cartographic approach. As you have said, the cartography of syntactic structures involves drawing maps of syntactic configurations that are as precise and detailed as possible (Cinque & Rizzi 2010:65). So, what are the motivations for you and other scholars to propose the cartographic approach?

Cinque: The first thing to say about cartography is that it is not a theory, but simply a research program, in a sense. It originated from a sense of dissatisfaction with the disconnected proposals that had been advanced for the functional part of the clause and of its major phrases. In the '80s and '90s, different people proposed the existence of different (often unnamed) functional projections and there were no constraints on what one could come up with. Although it seemed to go in the opposite direction from Chomsky's minimalist methodological lesson – namely, to try to constrain, as far as possible, the power of the theory in the sense of what is allowed to be referred to as a tool to describe a language – people often felt the need to postulate new functional projections to make sense of the facts.

The first hint of cartography, at least implicitly, can be found in an important article by Jean-Yves Pollock (1989), which for the first time adduced some empirical arguments from French for the presence of extra projections in addition to the tense projection and the verb projection: a projection of agreement distinct from tense. This additional projection was instrumental in accounting for certain differences between French and English. This work was influenced by Kayne's teaching in Paris in the 1970s and 1980s, which really brought about a new scene in Europe, since before that people had read articles on English syntax, especially from linguists in the United States, but there was no real school within Europe that trained people. Kayne played a very important role in showing how one could actually go about studying one's own language by painstakingly comparing what had been proposed for English. His work on French was instrumental in showing how you could come up with modifications of the principles and rules that had originally been proposed for English. That was the milieu out of which Pollock's work emerged.

On the other side of the Atlantic, there was also an important article by Steven Abney (1987) on the internal structure of the nominal phrase, which at the time was taken to be very poor, very flat. Everything was actually contained within a single projection, the noun phrase (NP), with the noun, its complement(s) and all the modifiers piled up inside. And he showed that something could begin to be accounted for by assuming that the determiner actually headed an extra layer, in a way that was, he thought, parallel to the sentence. So, those were the first two works that really opened up the cartographic research program.

And from there the discovery of new functional layers became a fruitful program that tried to motivate each new functional layer in terms of empirical cross-linguistic facts, not just theoretical ones. And a very simple empirical fact was the realization that lumping together modifiers, adjuncts, and complements within one and the same projection could not explain their correct order and constituency. Because you see they come in a specific order, which is unexpected under simple adjunction. In many cases these orders were very rigid, so it was easier to come up with a certain hierarchy that was then reflected in the linear order of these elements. In other cases, as we know, it appeared that certain orders were not really rigid, but when one delved more deeply into the facts one discovered that there was more subtle evidence to tease apart the apparent alternative orders and show that they were actually slightly different. Focalization and topicalization may obscure things. It may give you the impression that you can switch the order of elements. For example, you can easily say John talked *to Mary about Bill*, or John talked *about Bill to Mary*. So it would seem that the order of the two preposition phrases (PPs) is in a sense free, but once you begin looking at the behavior of preposition stranding then you discover that the two orders give different results, and that principle A behaves differently when you have one or the other order (Cinque 2006:148). So, in many cases it has turned out that the putative freedom of order is really just apparent. It derives from not considering a larger spectrum of facts that may show you that there is a rigid underlying order after all.

So, going back to the history of the matter, the first cases were, as I said, the enlargement of the sentence to comprise an agreement phrase in addition to the tense phrase on top of the VP, and DP on top of NP. Now, determiner phrase (DP), which is the standard terminology for the extended nominal projection, is really a misnomer, if you think about it, because it is not the topmost layer that is found in the extended nominal projection. There is at least one more layer that is given by universal quantifiers of the *all* type, so that in English you say *all those students* or *all the students*, or *almost all the students*. You have a phrase there. *All* is not simply a head, and it's a phrase that comes in a projection on top of DP. I think there is evidence to claim that non-restrictive relative clauses are merged even higher (Cinque 2008:116, fn.25). They take as their heads whatever comes underneath; namely, the universal quantifier phrase and DP. So, more layers exist above the DP. A big question is whether all languages have a DP, even those like Chinese that do not have overt determiners. This is a question debated today. You may have heard of Željko Bošković, part of whose work tries to motivate a large parametric difference between languages that have determiners and languages that do not. That is a very big question that remains to be settled, though my own opinion is that presence or absence of the DP layer cannot be a possible parameter of variation among languages, and that all languages have a DP.

Anyway, going back to the cartographic approach, the early '90s saw a flourishing of work that enriched the notion of extended projection proposed in 1991 by Jane Grimshaw. That was actually an important addition to the theory and to the cartographic approach that was emerging at the time. If you allow each phrase to have an extended projection – namely, material that is related to that specific kind of projection and that builds up a larger structure on top of NP, PP, adjectival phrase (AP) and so on – then of course one question arises very clearly: what is there in the extended projection? So, all of these strands really formed the basis of the cartographic enterprise. And if I may say something about my own work and that of Luigi Rizzi, we had been working roughly at the same time on the fine structure of the clause and on the left periphery of the clause, adopting

very similar assumptions. This brought us to propose a national research project, ‘On the Cartography of Syntactic Structures’, which was initially funded by the Italian Ministry of Research, and which has been producing a number of volumes (11 so far) within Kayne’s Oxford Comparative Syntax series.

A network of researchers, in Italy and in other countries, are now actively engaged in drawing finer and finer maps of the functional structure of the various phrases within a coherent framework of assumptions, despite the existence of minor differences of interpretation among the single researchers. One possible interpretation of cartography that I personally try to pursue is that all languages share one and the same structure, which is always present even in the absence of overt evidence for it. If there appear to be differences, these may be due to a number of factors, like the presence of silent elements – another hot topic that has been recently explored, especially by Richard Kayne (2005b). Not everybody working within the cartographic research program necessarily adopts this extreme position (a position shared, however, even by some linguists who do not work within cartography). This is a very strong position, which implies that if you find a grammatical feature in one language, then you are bound to postulate the same feature in every other language, even in the absence of overt evidence for it. As usual, it is methodologically good to take the strongest position possible because it makes you more demanding in looking at things. If you take things at face value, for what they overtly show, then you run the risk of not finding the deep similarities. You will stop there.

Meng: Could we say that the cartographic approach, whether in its strong or weak version, originated at the very beginning of generative grammar, given the fact that cartography is mainly concerned with the functional part of the clause and of its major phrases?

Cinque: Yes. One could say that the first cartographic proposal is in fact Chomsky’s (1957) ordering of perfect aspect, progressive aspect, and passive voice in the rewriting rule (aux → . . . (have + en) (be + ing) (be + en)) yielding sentences like (*the food*) *had been being prepared*. There, he gave a precise order to what are now known as tense and aspect functional heads of the extended projection of the VP.

Meng: Given Rizzi’s (1997) seminal work on the left periphery of the clause, could we also treat the attempts of Chomsky (1972) and Jackendoff (1972) as predecessors of cartography on the grounds that they intended to syntacticize the topic and focus outside of information structure to topicalization and focalization?

Cinque: In a sense, cartography is not a new program. Its novelty is simply that it takes to the extreme what has always been one of the major concerns of the generative enterprise: characterization of the structure of sentences and of the phrases that make them up. That is why one can see in the literature precursors of cartography in almost all of the domains of syntax. Even if Chomsky (1972) and Jackendoff (1972) had put information structure on the agenda, it was only with Rizzi (1997) that we started seeing strong empirical and conceptual evidence for a specific syntacticization of information structure.

3. Structural architecture

Mao: In my personal communication with Chomsky, I asked him whether MP and the cartographic approach assume the same structural architecture. He replied that the cartographic approaches make their own assumptions about structural architecture. What are the differences between MP and cartography in terms of the structural architecture?

Cinque: If we go back to the article Rizzi and I wrote (Cinque & Rizzi 2010), we actually cite a couple of places where Chomsky seems to say that the MP and cartography are compatible with one another. Chomsky's own work adopts a kind of abbreviation for something that might be bigger in terms of structure, although there are some differences, which I'll try to spell out.

What I mean is that Chomsky is interested in how phrase structure is constructed by the basic operation of merging two elements. One of these may be a head while the other is a phrase, or they may be two heads, or two phrases. The next question for him is which one of the two elements projects to form a new constituent. Ideally, there should be a mechanism that decides which one is going to give the label to the union of the two. Luigi Rizzi (2015) has contributed important insights to that discussion. And of course, it depends on what you merge from the lexicon. Chomsky is interested in the basic operations: external merge, labeling, internal merge (move), and possibly also constraints on movements, locality, and so on. But once you have merge and labeling, and once you have the lexicon from which you pick both functional and lexical elements, you also have cartography. Because it ultimately depends on what is present in your lexicon. So, if you have a head, and it is an aspectual head, then you merge it with, say, another projection that may have already been constructed by merge. You must have an edge feature that tells you whether the selection is correct. If you keep going and merge more and more lexical and functional elements, then you get cartography (if your lexicon is rich).

Mao: You mean the root of the differences may lie in the lexicon?

Cinque: Well, yes, in a sense it may. Because you have these features and heads that you are merging, taking them into the syntax. If you are word-based, you build up the structures. It depends on what you pick from the lexicon to build up your structure. And you also need some kind of selection procedure, to put the elements in the right hierarchy (and hence in the right order).

One could perhaps say that this order is given at the interface. I think Chomsky would tend to say it is not a question of syntax that we are confronting here, and that the ordering may be filtered at the interface with the Conceptual System. For example, the fact that a root modal verb is merged lower than tense, and tense lower than an epistemic modal, seems to depend on their semantics (at the conceptual interface). Clearly, the order has to be compatible with the semantics, but the question is whether semantics can do the whole job. In fact, I had an exchange with Chomsky concerning this very question. He seemed in the end to be almost convinced that the semantics may not be sufficient.

An important question remains: why is it that only a (tiny) subset of the conceptual notions that we have receives a grammatical encoding in the languages of the world? What I mean by that is that functional elements, which can be realized through auxiliaries, particles, suffixes, etc., express

only certain aspects of our cognition, such as the particular aspectual distinctions that we find, such as demonstratives, diminutives, evidentials, etc., but not other things that we could imagine they might express. So in that sense, there is no real contradiction. The difference may lie in what one takes to be inside the lexicon in terms of functional elements.

Mao: Your creative idea, the Cinque Hierarchy, has made present linguistic research more interesting. Current scholars are wondering whether the ideas or syntactic practices that the Cinque Hierarchy spurred are the same as or different from those of Greenberg's typological research.

Cinque: Well, I would say that they are different. On the basis of a survey of word orders across languages, Greenberg's typological work advanced extremely interesting generalizations on what word order variations are actually found and what correlations exist among them. He did not directly address the question of the total order of elements in a phrase or the clause; say, of the relative order of all their heads and modifiers. For the nominal phrase, he considered more elements (demonstrative, numeral, adjective, and noun), and he looked at the very orders that he found across languages. But apart from that, he did not pay special attention to the order of the functional and grammatical elements, or even the order of such modifiers as adverbs and arguments within the clause.

The Cinque Hierarchy came actually from the study of adverbs first. I had noticed that there was some rigid ordering among them. And then I realized that some of the adverbs actually bore a very strong resemblance to different aspects, tenses, and moods in the clause. So, for example, the so-called 'completive aspect' seemed to correspond closely to an adverb like *completely*; and the 'no longer' adverb seemed to correspond to another type of aspect, the so-called 'terminative aspect'. Higher adverbs showed an even clearer match with verbal functional heads – say, modal adverbs with modal verbs, evidential adverbs (like *reportedly*) with the evidential mood found in many languages, and so on and so forth. So I started looking at the order of the corresponding tenses, aspects, and modal morphemes among each other. These too come in a rigid order. For example, in Chinese there are suffixes like *-wan* and *-le* (*-wan* is a kind of completive aspect, and *-le* corresponds to one type of perfect aspect). Their order is strict: *-wan* precedes *-le* and cannot follow it (e.g. *Ta xie-wan-le yifeng xin* vs. **Ta xie-le-wan yifeng xin* (*he wrote a letter (to the end)*)).¹ What emerged was that the order of adverbs matched the order of the corresponding verbal functional heads. They were the two sides, so to speak, of the same coin.

That was actually what I did. Of course, there were gaps. Both in the sequence of adverbs and in the sequence of aspects, tenses, modalities, and moods. So I began to look through grammars to see whether the missing gaps could be found in some language; because each language has only a selection of these elements overtly. It may not show the whole hierarchy. And indeed, I found that corresponding to adverbs like *rapidly* and *quickly*, some languages had what people have called the 'celerative aspect', and to adverbs like *nearly* and *almost* some languages had what people have called the 'prospective aspect' ('to be about to V'). So I began filling the gaps in the correspondences. That developed into a very long stretch of projections. The adverbs are clearly phrasal elements. The aspect markers, like suffixes, particles, auxiliary verbs, and so on, appeared to be

¹ *-le* here is usually annotated as *-le₁* (aspect marker), which is distinguished from the sentence final particle *-le₂*.

heads. So the idea was that there is a correspondence between heads and their specifiers that are rendered by adverbs. Some languages may have an overt functional head while other languages may resort just to adverbs. To take one example, in Italian we do not have a verb that renders the idea of ‘to have just V’, which is labeled ‘retrospective aspect’ in the grammar of certain languages, such as French (*venir de*), or Spanish (*acabar de*). In Italian, we can express the same grammatical notion only with the adverb *appena* and the perfect form of the verb. I wonder if Chinese has something like that (Meng and Mao suggest Chinese *gānggang*). So again, the striking thing was that all languages seemed to have one or another way (either through a head or through a specifier or a combination of the two) to render the same grammatical notions. And that was the hierarchy that came out.

Going back to your original question. The hierarchy tries to reconstruct from different languages the putatively unique structure of merge underlying all languages. That is very different from Greenberg’s typology, which actually looks at the variation in word order among languages; but of course, there is a relation between the two. In order to construct the hierarchy, I had to undo, so to speak, the different surface word orders that Greenberg had observed and that obscure the unique structure. Two kinds of movements (two types of pied-piping) seem to be involved in obtaining the different orders. This is what I talked about at the Tsinghua conference (see now Cinque 2016).

4. Minimalism versus maximalism

Mao: Chomsky reiterates that language variation or parameter-setting is attributable to functional features in the lexicon (Chomsky 2014:12). If the cartographic approaches also rely on the functional features in the lexicon, are there any differences between these two?

Cinque: Parametric variation is said to be internal to the features in the lexicon, in the sense that you may imagine that a feature may give you a particular instruction on how you move a certain lexical element, or how you move the verb or the noun with respect to this lexical element (Rizzi 2011). I will give you one example: the order between proper noun and common noun. This is a very minute, typological correlation. Head-initial languages have the order of common noun > proper noun. Head-final languages display the opposite order. In Italian and Hebrew, you say *the river* ‘Mississippi’, and you cannot say *the Mississippi river*. Chinese goes with head-final languages, because you have to say *Chomsky professor*, *Mississippi river*, and ‘Tiananmen square’. Chinese, despite being an SVO language, has a number of head-final properties, including this. There are, in fact, many languages that are inconsistent. English is one such language, because you can say *the Mississippi river*, but also *the river Mississippi*. And there are certain common nouns that specify the order that they take. You say *Auburn Mountain*, but you have to say *Mount Auburn*. So *Mountain* has the order typical of head-final languages while *Mount* has the order of head-initial languages. This must be an instruction that is encoded in the lexical items *mountain* and *mount* in the lexicon, which tells you how you are going to linearize the proper noun with respect to the common noun. This carries over to many other nominal orders, like surname and given name. So, in Italian we have given name > surname. And in Japanese or Chinese, you have surname > given name. So you see that this is a very pervasive property that comes down to very minute things, like

surnames. In that sense, there is no real difference with Chomsky's conception, because he also puts parametric variation inside the lexicon.

Parametric variation can also be within one or the same language, as Kayne (2005a) has observed. Different lexical items can obey different parameters; namely, micro-parameters. In English, one says *very/too/so/that/etc. Good* but *good enough*, *enough* being exceptional in terms of linearization in that it has to follow rather than precede the adjective it modifies.

One could think that cartography maximalizes structures down to very minute details, that it is a kind of maximalism, in opposition to minimalism. But I think that people often give an overly narrow interpretation of minimalism. Certainly, minimalism imparts an important methodological lesson; namely, that we should be careful not to use redundant, superfluous principles when we can actually manage to account for things with minimal principled operations. But this leaves open the possibility that you can actually have a very large outcome by using the very same minimal operations. Think simply of the sentences you can construct with merge, and merge is a very simple operation; yet you can construct with it sentences of 200 phrases and heads. So, it is a question of distinguishing the formal operations from the products of these operations. Cartography simply says that we need not have rich operations, but that such limited operations can give rise to very rich structures, to a rich set of bricks (which come in a certain sequence). When you construct a house, you need bricks. These bricks are of different types, different sizes, and different shapes. And the same is true of linguistic 'bricks'. You have aspect, tense, modality, etc., to build your products. So I don't think there is a huge difference between MP and cartography.

Mao: Could we say, then, that Chomsky emphasized how to build a 'house', and cartography did the work?

Cinque: Cartography has been concerned with the bricks and the structure in which they are arranged. Chomsky has been more concerned with the forces that put and keep these bricks together.

5. Contradiction or compatibility?

Mao: You mentioned in your Tsinghua talk that the cartographic approach is a program, just like MP. With this in mind, what are the differences between these two programs and what is the best way to unify them?

Cinque: Cartography is even more of a program than the MP. It utilizes the basic notions of minimalism: merge, movement and the other kinds of tools that minimalism provides. It is a program in the sense that it strives to yield a map, that is as precise as possible, of the grammatical building blocks that are found in the languages of the world. In other words, it focuses on how many functional projections there are, and how they are arranged. In addition to that there are some auxiliary guidelines. One may wonder whether every functional projection is present in all languages and is always present in one and the same language or whether it should rather be postulated only when you see it? Some cartographic approaches indeed assume that they are always present even

if there is no apparent lexical element that expresses them. These are additional questions that the program raises.

As for the combination of the two programs, I think the answer is already implicit in Chomsky's approach and in the cartographic approach. Sometimes people who consider themselves minimalists do not pay attention to the precise mapping of the elements that the cartographers are interested in, but otherwise both groups utilize the same theoretical tools. A minimalist may not be interested in mapping out the entire structure of nominal phrases. Maybe he or she will choose a couple of projections, NP and DP, and be content with this without trying to fill in all the intervening projections, because he or she is interested in, say, how to derive c-command or what the proper labeling mechanism is. Cartographers are instead interested in whether there is something above DP and something below, between it and the NP. That is the only difference that I see. It is a question of what you are looking at, what you are interested in. But the two enterprises are completely compatible, it seems to me. One does not need to put in too much effort to render them compatible, so to speak.

Meng: I have noticed another difference; that is, multiple specifiers are allowed in MP (Chomsky 1995), while cartography still follows Kayne's (1994) claim that there can only be one specifier for each projection. If multiple specifiers are permitted, maybe there will no longer be such a proliferation of functional heads. So, why follow the Kaynean approach, rather than the MP?

Cinque: This is an empirical question that cannot be decided a priori. What is the evidence favoring one specifier for projection or multiple specifiers for projection? A possible piece of evidence for not having adverbs in multiple specifiers of VP (or some extended projection of VP) is related to the fact that I had discussed in my 1999 book; namely, the fact that in romance a verb can optionally be found in between any of the adverbs. Although today one should consider the possibility that it is the VP rather than the bare V that is raised around the adverbs, this seems to show that there is need for an extra projection of a different type between every two specifiers that contain the adverb phrases (this questions, at least for adverbs, the possibility that they sit in multiple specifiers).

6. Movement or splitting?

Meng: The binary branching hypothesis proposed by Kayne (1984) is not well equipped to handle the number, content, or even order of the head and other categories in the X-bar schema, which instead can be remedied either by introducing more movements or by splitting the structure. You prefer the latter. Is there any particular reason for that?

Cinque: Binary branching has been adopted by Chomsky with merge. You build up your structure, each time combining two elements, so you have binary branching; then you have another head and you have another binary branching, and so on. I think in Kayne's original work, he actually gave empirical evidence from the particle construction in English for binary branching. Even in Larson's work, you always have binary branching also for ditransitive structures, where you have verb, direct object, and indirect object; apparently ternary branching. But there is fairly good evidence that you

always have an asymmetrical relation, even in *I gave John a book*, where the first *c*-commands the other, but not vice versa. So that seems to show that you don't have ternary branching. If you had that, the two would *c*-command each other. So I mean there is also empirical evidence for binary branching. And I don't think that it is problematic for syntactic structures at all.

I am also thinking of the particular interpretation of antisymmetry where you always have specifier–head–complement up to the lowest element, but you never go on beyond the verb or the noun continuing down with other structures. Everything is piled up on top of V or N. And whatever you find to the right is a function of movement. And the reason for that comes from the left-right asymmetry that you find everywhere (Cinque 2013a). This means that to the left of the verb, of the noun, of the adjective, etc., you only have one structure, only one order. To the right, you have more than one order. You have either the same order or the mirror-image order. There are some more complicated cases where something is before and something is after the V or the N, but when you have everything before or everything after the verb, there is an asymmetry. One order on the left, two or more orders on the right. These are the same order in a sense, because it's either literally the same or the mirror image, which is again the same order. If you look at yourself in the mirror, you see the mirror image of yourself, but you are in a sense the same. So it's the same order although you see it in two manifestations. And this asymmetry comes from movement. One way to make sense of this asymmetry (one order on the left and two orders on the right) is to think of it as the movement of NP, VP, AP, etc. that creates the two orders on the right from the unique order on the left. If you assume that only NP, VP, AP, etc. can move, not everything can move, and the movement can occur in either one of the two ways, namely the two types of pied-piping (*whose-picture* and *picture-of-whom*). Thus, you obtain the two orders after the noun or the verb and you obtain one order in front; there's no other way you can move things around. So, in that sense, head-initial and head-final languages are derived from one common structure via the two different ways you can move. This is the idea I presented in my talk at the Tsinghua conference.

7. Morpho-syntax interface

Meng: As we know, the past two decades have witnessed a hot debate between (weak) lexicalism proposed in Chomsky (1970) and anti-lexicalism as argued by Distributed Morphology in Marantz (1997). And the working assumption of cartography is 'one (morpho-syntactic) property – one feature – one head' as suggested in Kayne (2005a:15). So what position has cartography taken with respect to the relationship between syntax and morphology?

Cinque: While a number of people working within the cartographic program have taken the position that most of the morphology can be syntacticized, – that is, built into the syntax through the movement of lexical categories to pick up affixes – cartography by itself is compatible with different theories of morphology, as far as I can see. Possibly, a principled distinction must be made, in any case, between inflectional and agglutinative morphology – the latter being more clearly amenable to a syntactic treatment than the former (cf. Chomsky's proposal that inflectional features are simply 'checked' during the syntactic derivation (Chomsky 1995:195), and Cinque's suggestion to make it compatible with Baker's Mirror Principle (Cinque 1999:186)). Inflectional morphology has a number of properties that make it difficult to treat in a purely syntactic fashion: multiple exponence,

suppletion, no suspended affixation, irregularities of all sorts. That's presumably why Chomsky (1995:195) suggested that checking is involved.

8. Principles and parameters

Mao: Nowadays, while biolinguistic research is gaining momentum, the Principles and Parameters framework is still on the research agenda. Different scholars, though, have different interpretations of principles and parameters. For instance, in Chomsky's (2012:13) view, Merge is the only Universal Grammar (UG) principle; parametric variation is restricted to the lexicon, or to functional elements of the lexicon (Chomsky 2014:12) (the Borer–Chomsky Conjecture). In this sense, if we follow the cartographic approach, how do we define the principles and the parameters?

Cinque: As I said, cartography falls squarely within the MP, and utilizes movement, merge, and other minimalist principles. As for parameters, the big question is whether we should assume the existence of macro-parameters in addition to micro-parameters. There definitely seems to be more evidence for the existence of fine-grained parameters (micro-parameters). In any case, they are surely encoded in the functional lexicon, and, I would say, even in the substantive lexicon. Today (November 10, 2014) we discussed the case of kinship terms: lexical items like *father*, *mother*, etc., corresponding to different referents in the world. There appears to be a rich underlying system there. And there is parametric variation among languages as to how each encodes the kinship features into lexical items. For *grandfather* and *grandchild*, one language uses two separate words, and another the same word, depending on how much one specifies or underspecifies. So it is not only the functional lexicon that can be parametrized. It is the whole lexicon. All of its features can be parametrized, functional, and substantive. Again, there is no principled difference, I think, between these two parts of the lexicon (Cinque 2015).

The only real difference that I see is how one interprets these features. Are they part of UG? Do they or some of them belong to narrow syntax? For Chomsky, apparently the only UG principle(s) is merge (and recursion). However, it may turn out that to think of UG as being characterized only by operations, and not also by substantive elements, is too reductive. Let me go back to Chomsky's *Aspects* (Chomsky 1965), and its distinction between formal and substantive universals. It seems to me that one should be careful before abandoning the idea that there are also substantive universals. As I said, discharging substantive universals to the interfaces (semantics and phonology) cannot explain why we find what we find in language after language, rather than something very different. As I said, why is it the case that all languages have demonstratives, all languages have a high functional adjective like *other*, all have diminutives, and no language has a category of, say, 'dangerositives' – namely, a grammatical element telling you whether something is dangerous? In that respect, I think there is much more in UG than just the principle of merge, but this is a personal view. With all my respect for Chomsky's recent ideas, I would rather go with his earlier idea of a distinction between substantive and formal universals, thus attributing more substance to UG than just merge, or recursion.

Mao: If we accept that UG includes the universal principle merge and the UG inventory of features, is there any difference between the cartographic approach and MP in terms of the conception of principles and parameters?

Cinque: If that assumption were so, then there would be no difference, although a difference might lie in what one takes a possible feature of UG to be. I don't know what Chomsky may have in mind concerning possible features. In cartography, I think, people would assume that you have a lot of features. These are universal, and innate. They certainly correspond to features in our cognition. But they seem to be a subset of the features present in our cognition. That is the challenge, which seems to motivate why we want to attribute such features to UG. If they were exactly the same features that are part of our cognition, then we would not need to put them in UG. If we did not find any difference in terms of what is encoded grammatically with respect to what is present in our cognition, then we would not need to assign them to UG, because cognition would already take care of them. But if you find that, linguistically speaking, of the entire set of cognitive features, only few receive a grammatical encoding by some functional element, then the question arises as to how we can account for that. It seems to me that a possibility is that at some point in the evolution of our species, UG became crystallized, encoding just a subset of our cognitive notions/features. This raises the important question of why certain things rather than others are encoded grammatically, and why they are encoded in the way they are.

Mao: Regarding this question, if we follow Professor Chunyan Ning's ideas presented at the Tsinghua conference – namely, that the human species is endowed with the same 'sleeping ideas', some of which can be awakened while others cannot, depending on the recursive property of language rather than the mind, would it then be possible to explain why certain concepts are encoded grammatically?

Cinque: I would translate what Professor Chunyan Ning calls 'sleeping ideas' – a nice metaphor – as underspecification, as in my discussion on parameters in the lexicon (Cinque 2015).

One example: in Italian, we have an adverb, *presto*, which translates into English as either *soon* or *early*, two different adverbs. Now, the interesting thing is that depending on the interpretation, Italian *presto* occupies two distinct positions; those occupied by *soon* and *early* in English. *Early* is one of the lowest adverbs, as it is necessarily postverbal. You have to say, *I woke up early*, rather than **I early woke up*. But you say *you will soon discover that*, not **you will discover soon that*. If we put *presto* preverbally in Italian, it gets the interpretation of *soon*; if we put it postverbally, it gets the interpretation of *early*.

What does that mean? We are using one lexical form, capitalizing on what is common between *soon* and *early*. English capitalizes instead on the small differences that there also are between *soon* and *early*, thus using two different lexical items. But the two share some meaning component. That is why some languages can use the same form for both meanings. So, this means that somehow you are underspecifying certain features, utilizing only, or lexicalizing only, part of the features – those that are common to the two. There are languages, for example, that don't make a distinction between the two types of *or*, the inclusive and the exclusive. If you say *Tomorrow, Bill or John will come, etc.*, the inclusive interpretation is: either Bill, or John, or both will come. While the exclusive one is: either John or Bill, but not both will come. Some languages, such as American Sign Language, even underspecify disjunction and conjunction, using the same word for *or* and *and*. You have one single word to express general coordination, and then you resort to context to know whether it is *and* or *or*. So this is a very pervasive source of parametric variation among languages in the lexicon.

And I think Professor Ning, if I understood him correctly, had something very similar in mind; namely, that you do have all these features, but some of them are not expressed overtly. They are sleeping, so to speak; they remain silent.

9. Language acquisition

Mao: Coming back to the Cinque Hierarchy, if we make use of it to predict the acquisition problem, could we say that the features in a higher position (head) of the Cinque Hierarchy are more difficult to acquire than the lower ones in first language acquisition (FLA), or in second language acquisition (SLA)?

Cinque: I think the difficulty may reside not so much in ‘acquiring’ the hierarchy – because the hierarchy, I guess, should come pre-compiled, so to speak, in UG – but in its maturation. That is my hunch. It is, strictly speaking, not learned, though one has to learn what lexical items correspond to which lexical features. So you would not expect some language to have a hierarchy that is different from that of another language. That does seem to be the case. At least, it seems to me that there is a real hope that some form of that hierarchy (which certainly has to be completed, modified in certain respects, and refined) may be part of UG.

So the difficulty might lie in two domains: (i) in understanding which combinations of features are translated into which lexical items in one’s language (in FLA) and in other languages (in SLA); and (ii) in the maturation of the different layers of the hierarchy (in the phases that children go through). In FLA, thinking of work that has been carried out in Europe (Cinque 2006:120), it seems that children start out from the lower part of the hierarchy. So in terms of the adverbs they use, children seem to acquire aspect first. Tense comes later, and higher parts of the hierarchy are acquired and mature even later. I do not know if this suggests that higher functional heads are more difficult to acquire.

As for SLA, that is an empirical question. Languages have the same features. The point is that, given the different arrangement of these features in the two languages, one may have difficulties in recognizing exactly how they are differently assembled in the two languages. I think generally it is difficult when you pass from one language that is underspecified to one that is more specified; for example, if you speak Russian or Chinese, which do not have articles, and you learn a language like Italian, which has articles. Sometimes we use articles, sometimes we don’t. You have to understand when to use them, or which exact sub-kind of article to use. That may be very difficult. It would be easier for an Italian to pass to Chinese, because you do not have articles. So, you simply omit them. In the use of articles, there are differences even between English and Italian. Both languages have articles, but they use them in slightly different ways. English uses them in fewer contexts than Italian. It does not use them with plural indefinite NPs, with generic ones, etc., whereas we use articles there. As a result, independently from maturation, if all languages have the same kinds of features, the difficulty seems rather to reside in how you have to decompose them in one language and recompose them in the other language, or it may reside in recognizing how the features are put together in particular lexical items in one language as opposed to another. So you have to discover these things that are real differences among languages. But it is not clear whether one feature is more difficult than another.

Meng: Based on Heine & Kuteva (2002), the number of functional categories is almost 400; thus, what is the consequence of this for FLA? Or, in other words, how long will it take to set the value of the parameters? In fact, with further multiplication of functional heads, the number of specifiers increases as well. Does this affect FLA?

Cinque: If the number and quality of the functional features that are drawn from the lexicon to build syntactic structures via merge are part of UG (as are the possible ways in which internal merge (move) can operate to yield the actually attested surface orders of elements of languages), then the task of the child will reduce to recognizing how the functional features are assembled in different functional and lexical morphemes. The child does not need to learn the functional features, nor the way in which internal merge operates.

10. Challenges for cartography

Meng: Going back to the strongest positions you have taken with respect to the hierarchy, the order is unique and rigid. However, van Craenenbroeck (2009) points out that transitivity may fail to work in some languages. Take Norwegian adverbs as an example; *ikke* (*not*) precedes *muligens* (*possibly*), and *alltid* (*always*) precedes *ikke* (*not*), then, by transitivity, *alltid* (*always*) should precede *muligens* (*possibly*); however, this is contrary to fact. How would you explain such an exception? To what extent can the hierarchy be weakened if the objection is correct?

Cinque: I don't think the objection that transitivity fails is correct. The cases brought up in the literature, by Bobaljik (1999) and in van Craenenbroeck's book, are not decisive. I conduct a brief discussion about one such putative transitivity failure in note 43 of my article 'Issues in Adverbial Syntax', chapter 5 in Cinque (2006).

Meng: Some people still argue that discourse and pragmatic information should not be syntacticized, while this is what cartography has been assuming. What's your comment on this opposition?

Cinque: Well, you see, it is already clear in Rizzi's (1997) work on the left periphery and in Cinque & Rizzi (2010), in which we explicitly say that cartography *is* a kind of syntacticization of at least part of the informational structure. In that sense, the syntax is already predisposed to interface with discourse, with syntactic structures that have already been introduced before or even no syntactic structures if there are appropriate contextual conditions. For example, in deep anaphora in English, someone might say to you, *I can do that*, even if you did not say *I can't open this bottle*. You don't need to say *I can't open the bottle*. If I see that you are trying to open a bottle without success and then you look at me, I might say *I can do that*. But you can only do it with *do it*, *do that*, etc. but not with VP deletion.

There is a famous article by Jorge Hankamer and Ivan Sag in 1976 in *Linguistic Inquiry* that distinguishes deep anaphora from surface anaphora, like VP deletion. So it is an empirical question of how much structure one needs in the syntax that interfaces with discourse. And people have also come up with the old performative analysis. There is a speaker, an addressee, and apparently there are parts of the grammar that refer to the participants of the speech act, so that one might think of really having a speech act projection or something like that.

11. Prospect of cartography

Meng & Mao: Last but not least, as one can see, the splitting tradition has witnessed the expansion from inflectional phrase (IP) and DP domains to VP, complementizer phrase (CP), and PP domains, and this line of research has already made great contributions to the generative enterprise. We would like to know what you would say concerning the prospects of cartography.

Cinque: The task of mapping out the internal structure of the different phrases that make up the clause (and that of the clause itself) is far from being finished. We have a first fragment of the internal structure of some of the phrases, which still needs to be refined and completed. Other phrases still wait to be subjected to serious investigation; among these are the adjectival phrase, the adverbial phrase, and the quantifier phrase. So a lot more work is still needed. Another issue that will have to be addressed once we have a finer-grained picture of the internal structure of the different phrases is whether the hierarchies that are being uncovered can be derived from more abstract principles (Rizzi 2013); and why of all the notions that make up our cognitive systems only a subset is encoded grammatically, and is arguably the same for all languages (Cinque 2013b).

12. Concluding remarks

The study of syntactic structures has always been a central concern of generative linguistic studies, and the headedness constraint, in a sense, enlarged the classical X-bar theory of Chomsky (1970) to the extended one by identifying the non-lexical material to be the head of a projection, represented by Chomsky (1981), Fukui & Speas (1986), Chomsky (1986), Grimshaw (1991), and others. With this theoretical development, scholars were able to postulate new functional projections to make sense of linguistic facts, and satisfy the analytic necessities of particular morpho-syntactic problems. Therefore, such works as Abney (1987) and Pollock (1989) emerged. It is out of this milieu that Rizzi (1997) and Cinque (1997)² initiated the cartographic program.

As the interview reveals, cartography advocates two basic theoretical assumptions, which are closely related with the fundamental issues of generative grammar and influence the views of cartography towards other relevant issues mentioned in the interview. The working assumption of cartography about the structural architecture of language is the idea that one feature corresponds to one head (Cinque & Rizzi 2010:67), and that the positions of syntactic structures could be filled by corresponding syntactico-semantic features. Following this tradition, the Cinque Hierarchy is believed to be one of the most successful examples of aligning functional projections. Meanwhile, the basic idea behind the assumption of structural architecture and the Cinque Hierarchy is that all languages share the same set of morpho-syntactic features, with cross-linguistic variation caused by the lexicalization of specified or underspecified features (see ‘Motivations of cartography’ in the interview).

² This is the first appearance, in vol. 7 of University of Venice Working Papers in Linguistics (see: <http://lear.unive.it/jspui/simple-search?query=adverbs+and+functional+heads>), of what became Cinque (1999).

Concerning the basic theoretical assumptions of cartography, criticisms emerged, such as its being ‘a baroque version of Minimalism; empirically well motivated but did not cope with the requirement of architecture simplicity of the language faculty’ (Poletto 2012). Yet these criticisms never nullified the achievements of cartography. On the contrary, cartography can be seen as a practical program in the exploration of the nature of language on the grounds that cartography, adopting the basic assumptions and practices of MP, strives to characterize precisely the structure of sentences and of the phrases that make them up. In this sense, we think that it is time for generative linguistic circles to dispel the theoretical puzzles that cartography puts into our sight (setting aside technical puzzles for the moment).

The first puzzle brought about by the basic idea is whether it is proper for cartography to propose that all languages share the same functional and substantive universals (features) that result in so many ordering projections. This assumption goes against the viewpoint that languages may differ in the type or number of functional projections they select from a universal inventory or their order (Cinque & Rizzi 2010:69). Empirically speaking, the finer maps of functional projections denote a clearer understanding of the nature of language. Thus, the real question turns out to be whether the features presupposed and closely related with the finer maps result in a rich UG. This is the very theoretical concern in the circle. Cinque & Rizzi (2010:68) argue that this question is important but fundamentally orthogonal to the prior task of drawing their precise map. The reason for this argumentation, in our view, is attributable to the division of labor between minimalism and cartography, which is also discussed in the interview (minimalism vs. maximalism). If this understanding is on the right track, it seems that cartography should not be blamed for its finer description of syntactic structures. Even though proposing more features for the UG inventory makes UG a little bit more redundant compared to the principles proposed in government and binding theory, it seems that the ‘why’ questions that transcend explanatory adequacy would be addressed practically in this way, because the explanation of language evolution by micro features is superior to that of principles. As a result, then, what really counts is what theoretical contributions to MP would be obtained in terms of the two kinds of universal features.

The second puzzle related to the basic idea is whether it is proper for cartography to assume that both the functional and the substantive features are parametrized in the lexicon, providing a solution to parameter-setting. It is clear that in MP the functional features are commonly admitted as the core construct in syntactic projections, and thus the decisive factors in parameter-setting; whereby the substantive features are discharged to the interfaces (e.g. the sensorimotor system (SM)). However, if we put the existing projects of parameter-setting into an integrative proposal – namely, unifying the pre-syntax lexical parameter and the post-syntax externalization of parameter at the phonetic level – it seems that both discharging the substantive universals into necessary orders at the interfaces and parametrizing the substantive universals in the lexicon are the methods of parameter-setting. That is to say, in addition to the parametrization of the substantive universals in the lexicon, they would also be parametrized in the SM system, because ‘Merge leaves elements unordered’ (Chomsky 2014:7). Technically speaking, the extended projection proposal supplies a method to reconcile the tension between MP and cartography in terms of the parametrization of substantive universals on the grounds that both the functional and the substantive universals are supposed to project. Yet, theoretically, whether the integrative proposal of parameter-setting is the solution to the puzzle remains unclear at present (Mao & Dai 2015a, 2015b). But one thing is

certain. If we accept the basic idea of cartography, a real challenge is to explore the origin of features which are essential elements for syntactic projections. As questioned in the interview, why is only a subset of cognitive features encoded grammatically in UG, and why that precise subset? This is a fundamental issue for feature-driven cartography, and of course for MP as well. Therefore, it is a very important topic for future research. Furthermore, whether the order sets of functional projections could be more accurate, and in what sense the ordering functional projections are helpful for the explanation of language acquisition, are topics worth exploring in the future.

Up to now, syntactic practices have witnessed the splitting tradition from IP, DP, VP, and CP to PP domains, and this is still in progress. Given this research program's cross-linguistic background, we are obliged to call the attention of more linguists, particularly Chinese scholars, to this practical way of studying syntactic structures. The reason for this lies in Chinese robust analyticity; namely, its 'in-situ-ness' is ideal for linguists to map out the 'topography' of a variety of specific Chinese constructions, which offers a window into the origin of some heavily 'scrambled' constructions often observed in other languages (Tsai 2015:vii). And in fact, more and more Chinese syntacticians, Taiwan and Hong Kong scholars in particular, are participating in this line of research, among whom Chih-Chen Jane Tang, Dylan Wei-Tien Tsai, Sze-Wing Tang, and Candice Chi-Hang Cheung have already produced some interesting and influential works, some of which are already being published as the eleventh volume of Kayne's Oxford Comparative Syntax series (i.e. Tsai 2015). Since the program is far from being finished and more work needs to be done, we hope this interview will attract more practitioners to this project.

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生成大業之製圖工程 —Guglielmo Cinque 教授訪談錄

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製圖工程是一種精細刻畫句法結構的研究框架，嘗試描繪人類語言功能語類投射的完整圖譜，但學界對其理論必要性尚存質疑。鑒於此，訪談從製圖工程的緣起出發，較為全面地考察了製圖工程的理論與技術細節，力圖揭示製圖工程與最簡方案在語法構架上的相容關係，以及在特徵參數化等方面對最簡方案的貢獻。此外，訪談簡要闡釋了製圖工程面臨的挑戰與前景，並分析製圖工程帶來的兩個問題。

關鍵詞：最簡方案，製圖工程，構架，最大化主義，特徵