From Minimalism to Cartography: towards a unified account[1]

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Nowadays more than ever, with the advance of linguistic research and its tendency to combine multidisciplinary approaches, the moment has arrived to face the structural representation of sentences as a powerful device capable to account not only for adult L1 data but also for child and impaired language. To fulfill this aim, the present paper attempts to provide a unitary account for Chomsky's (1995ss) Minimalist program and the cartographical approach (Belletti 2004, Cinque 1999, 2002, Rizzi 1997, 2004 and much related work) considering some phenomenology for the different populations involved.

1. Introduction.

We depart from the theory of linguistic competence provided by the Generative framework according to which human beings are endowed with an innate component associated to the language faculty, namely Universal Grammar (UG). It is a set of principles, some recursively applied, what determines the number and form of the grammar of human languages. The formal characterization of a language, i.e. the grammar, consists of two main components: the Lexicon and the Computational system (Chomsky 1995 and much subsequent work). The lexicon is a set of grammatical objects formed by a subset of features out of the total set of features that are universally

possible. The Computational system relates the semantic and the syntactic features of the items selected from the lexicon. The proposed system is modular, i.e. grammar is seen as a component that interacts with other systems such as memory, belief, or perception.

The Minimalist program (cf. Chomsky 1995ss), rooted on these assumptions, provides further detail proposing a model of grammar articulated into:

a) Lexicon.

b) Numeration: items that form a given sequence are selected from the lexicon. Avoidance of memory-overloads.

c) Materialization – Spell out: manifestation of the relevant linguistic information for the interface levels.

d) Phonetic form: associated to articulation and perception.

e) Logical Form: associated to intentionality and concepts.

The Lexicon and the Numeration are considered parts of the language faculty while the rest is part of the Computational system. A representation of the model has been inserted in Fig. 1 below.

Figure 1: Grammar.
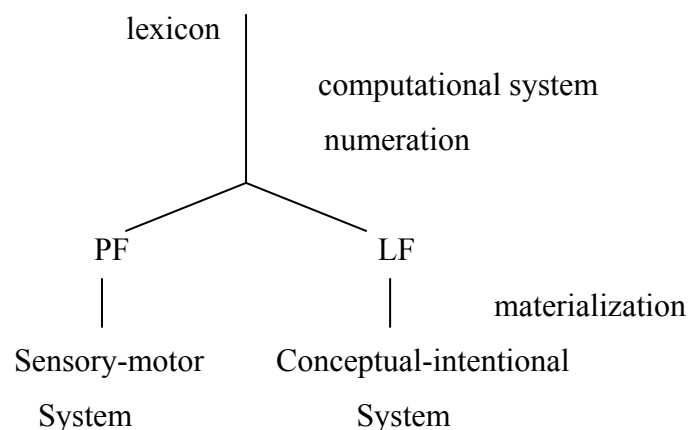
In contrast to previous models/conceptual frames, such as for example Principles and Parameters (Chomsky 1981), the MP aims to achieve a higher explanatory power. Grammatical principles and parameters are not only identified but also justified taking into consideration the nature of the external systems (e.g. cognitive systems such as memory or perception that interact with grammar). The main emphasis of this program falls into economy considerations. Simplicity is pursued to save unnecessary resources that may affect the efficiency of the grammatical system. The idea is that syntactic operations must minimize computational memory to the maximum. At each derivational level, decisions about the required operations are based on the configuration previously obtained. Results previous than that or derived possibilities are not considered.

A further contribution of the Minimalist Program is the claim that the levels of representation, namely the Phonetic Form and the Logical Form, can only contain interpretable features for the interface systems. It is the relationship between features what regulates and leads the system. The possible effects of that relationship consist of different grammatical operations: Merge, Check and Move. These operations, triggered by the selection of an element that must saturate a property relate two features or two sets of features in a syntactic configuration.

As far as movement is concerned, the MP emphasizes that this operation is not cost-free. In fact, optionality is not even a possibility, i.e. movement appears as a last resort operation, since it is governed by the demands of other systems. Some of the triggers of this operation would be the satisfaction of discourse conditions or the scope marking of an operator (Chomsky 1995).

In addition, as any other syntactic operation, movement is only local, i.e. it can only be applied to a minimal structural domain. The structural configuration in which it applies can be minimally defined by a principle of minimal structural distance (cf.

Chomsky and Lasnik 1993 and references cited therein). Movement consists of the displacement of an element from a position to a new one c-commanding it (1).

(1)   *C-command:*

A c-commands B iff A does not dominate B and every X that dominates A also dominates B.

(Reinhart 1976)

When A merges B, A c-calls the members of B.

(Chomsky 2000)

Two types of movement are considered: raising to a specifier position (e.g. wh-movement) and head-to-head movement (Travis 1984ss). Movement operations can cause new internal merge[2], i.e. the union of a subpart of an existing structure with a distinctly rooted one (Chomsky 2001). This new operation is embedded in the external merge[3] that caused movement in the first place.
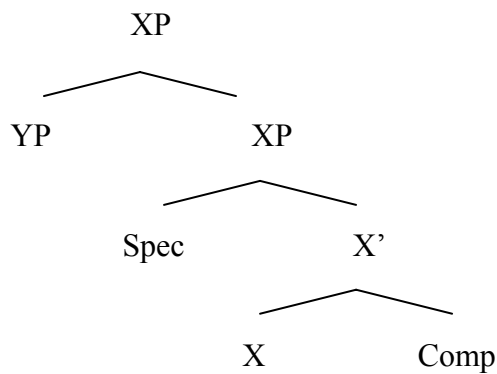
The MP claims that it is by means of merge operations, whose function is to build larger units out of smaller ones, that the structure can be expanded by means of reduplication of specifier positions. Nevertheless, the reduplication of a category is banned. The resulting structure is represented in Tree 1 below. The minimalist way of enlarging the tree-structure is critically different from the Cartographical proposal we will discuss in brief.

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[2] Internal merge: related to discursive aspects (Chomsky 1995).

[3] External merge: related to thematic relations (Chomsky 1995).

Tree 1: Specifier reduplication

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              XP
          ╱────────╲
       YP            XP
                 ╱───────╲
              Spec         X'
                       ╱───────╲
                     X           Comp
```

For de MP, features are central to computational operations not only for movement to take place but also to account for phenomena such as that defined as the Extended Projection Principle (2).

(2) *Extended Projection Principle*.

Sentences must have a formal subject.

The EPP, triggered by the presence of a feature, attracts constituents to the domain of the functional category containing it. This operation takes place simultaneously to checking operations.

The checking relationship among formal features consists of the deletion of uninterpretable features through the derivation process. The relationships take place between the features of a lexical category and their corresponding ones in a functional category. A possible way to implement these relations would be to assume that lexical elements enter the Numeration with their features already valued while the formal features conforming functional categories are selected unvalued.

All these refinements lead to a modification of previous versions os the Principles and Parameters approach (Chomsky 1981). The minimalist tree structure is represented in Tree 2 below:

Tree 2: Minimalist Tree

```
      CP
     /  \
        IP
       /  \
          (vP)
         /   \
             VP
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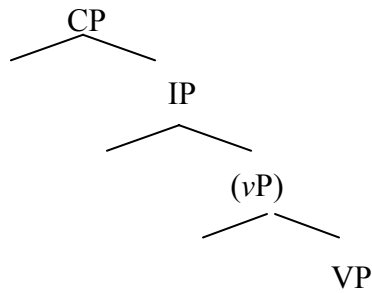
After this brief characterization of some minimalist assumptions, we will concentrate on Cinque's (1999), Belleti's (2004) and Rizzi's (2004) cartographical approach, which despite of being in apparent opposition to the Minimalist Program, is in fact easily reconcilable with it (3) since the material inserted in a "cartographical" tree structure is interpretable in Chomskian terms (4).

(3) 'The tension is only apparent. [...] the possibility that each "core category" [C, T, *v* and V] may, in fact, be shorthand [...] is explicitly acknowledge [in Chomsky 2002: 8]'.

(Rizzi 2004: 6)

(4)   'Syntactic representations should end up containing only information that can be visible, hence interpretable, to the other cognitive systems'

(Belletti 2004: 5)

In addition to interpretability requirements, there are some other important basic assumptions commonly underlying both programs, such as interface conditions and economy considerations (Rizzi 2004). According to the so-called cartographical approach, the syntactic structure is articulated in three levels: the lexical, the inflectional and the complementizer level. Rizzi (2005) claims that it is UG what defines the hierarchy of position of clausal structure which can be characterized in 'cartographical' terms. The lexical level is headed by the main verb or the nucleus of the predication, i.e. a noun or an adjective, which assigns thematic information defining the configurational space in which thematic roles are assigned. The inflectional level is organized around functional nuclei mainly related to morphological verb marks. The hierarchically higher level in structural terms corresponds to the complementizer system which is defined as a heterogeneous set of functional categories such as subordination marks, topics, focus or wh-elements. These three levels also correspond with those assumed by the MP.

Originally, the complementizer level was identified with a single projection, in accordance to the principles of the X' theory (cf. Chomsky 1972ss, 1995). Similarly, the lexical level was identified with VP and the inflectional level with IP. It is around the 80's when the different levels start to be decomposed giving to the syntactic representation its more developed cartographical appearance turning single nodes into more extended fields. Larson (1988) provides the first proposal for the decomposition of VP, Pollock (1989) for IP and finally, Rizzi (1997) for CP. In accordance to Rizzi's (2005), 'in its maximal expression' the system starts from the left periphery and more specifically from the Force position (Rizzi 1997) and includes both obligatory and optional positions. Only obligatory positions such as Force or Tense constitute the backbone of the clause.

Due to space limitations and for the sake of clarity, we won't give a detailed account of the functioning of the categorical cartography. We address the reader to the already mentioned classic references. Nevertheless, as an example, Cinque's (1999) classification of adverbs has been represented in (5):

(5)   *Hierarchy.*

[Moodspeech act *frankly* [Moodevaluative *fortunately* [Moodevidential *allegedly* [Modepistemic *probably* [T(Past) *once* [T(Future) *then* [Moodirrealis *perhaps* [Modnecessity *necessarily* [Modpossibility *possibly* [Asphabitual *usually* [Aspprepetitive(I) *again* [Aspfrequentative(I) *often* [Modvolitional *intentionally* [Aspcelerative(I) *quickly* [T(Anterior) *already* [Aspterminative *no longer* [Aspcontinuative *still* [Aspperfect(?) *always* [Aspretrospective *just* [Aspproximative *soon* [Aspdurative *briefly* [Aspgeneric/progressive *characteristically(?)* [Aspprospective *almost* [AspSgCompletive(I) *completely* [AspPlCompletive *tutto* [Voice *well* [Aspcelerative(II) *fast/early* [Aspprepetative(II) *again* [Aspfrequentative(II) *often* [AspSgCompletive(II) *completely*]

As mentioned before, the richness of postulated positions is a critical difference with respect to the MP. For the Cartographical approach, there is a universal hierarchy of constituents that are legitimized by functional elements that are overtly manifested or not depending on the available elements of a particular language. Rizzi (2002) assumes that the heads contain features which legitimize a specifier position. A typology of specifiers would therefore correspond to the typology of their legitimizing features. In Chomskian terms (cf. Chomsky 2000), heads would contain an EPP feature allowing the realization of a specifier by attracting an element to this new position with agreement between the feature(s) of the head and the element occupying such a position.

2. CP

After this brief general characterization, and in order to provide a suitable ground to set up our proposal, we will concentrate on providing some insights on one of the functional fields enumerated by the cartographical approach, the CP-field.

The CP category was introduced in the syntactic representation after Bresnan (1970) as a syntactic object that hosts subordination marks (6a). The same way that subordination marks are peripheral elements, there are also some other elements that share this same characteristic and hence appear under the CP domain. A classical example in many languages is the case of wh-elements such as (6b):

(6)   a.   Veo *que* Juan no llega.   (Spanish)

                see-pres.1st.sg that J. not arrive-pres.3rd.sg

                I see that John does not arrive.

        b.   *¿A quién* le regalaste el pañuelo?   (Spanish)

                to whom him give(as a present)-pret. 2nd.sg the handkerchief

                Who did you give the handkerchief to?

According to the classical analysis, *a quién* 'to whom' moves from its original position inside the VP to the specifier of CP. Nevertheless, some empirical evidence seems to require a more articulated structure in the CP area in order to accommodate several elements, i.e. a single specifier and a head position is not enough to reflect the different syntactic or interpretative processes (7).

(7)   a.   Luis dijo *que cuándo* vendrías.   (Spanish)

                 L. say- pret.3rd.sg that when come- cond.2nd.sg

                 *Luis said that when would you come.

                                 (Brucart 1993)

           b.   Pregunten *que*, a la Maria, *quan* li donarem el regal.   (Catalan)

                 ask-pres.3rd.pl that, to the M., when her give-fut.1st.pl the gift

                 *They ask that, to Mary, when will we give her the present.

                                 (Villalba 2000)

The indirect interrogatives in (7) have both a complementizer and an interrogative element. In *Filters and Control* (Chomsky and Lasnik 1977) had proposed a principle leading the relative order of constituents in the syntactic hierarchy where CP constitutes the higher node. Therefore, a construction showing a complementizer (which according to the literature should occupy the C position) to the left of the wh-constituent (which should be placed in SpecCP) would be problematic. Two proposals to account for the examples in (7) are those by Plann (1982) and Suñer (1986). Plann (1982) appeals to the capacity of recursion of the CP node and proposes a duplication of this functional node to accomodate further material. Suñer (1986) also relies on recursion to account for these data but proposes a double Spec position to accomodate both elements. This proposal contradicts Fukui and Speas (1987) claim that every functional projection must only have a single specifier position (see also Kayne 1994 for the proposal that projections must contain a unique specifier position). The underlying idea of recursion is common to both proposals and one of the central properties of human languages (Hauser, Chomsky and Fitch 2002).

Further evidence against a monolithic analysis of CP is the case of negative inversion in English. This rule causes movement of the negative constituent as well as auxiliary movement (e.g. Lee said that *at no time would* she agree to visit Robin). Decomposition of CP is required in order to accommodate two different constituents between the complementizer and the IP (Haegeman 2000). Similarly, topicalized elements appear in a position external to the IP domain (8a). It is also noted that the same sentence can contain more than a Topic (8b), hence, this syntactic position must be seen as recursive.

(8)   a.   La carta, la escribimos ayer.   (Spanish)

the letter, it write-pret.1st.pl yesterday

The letter, we wrote it yesterday.

         b.   A Julia, la carta, se la escribimos ayer.

to J., the setter, her it write-pret.1st.pl yesterday

*To Julia, the letter, we wrote it to her yesterday.

Rizzi (1997) proposes to assign a proper structural space for all the possible elements appearing in the CP (left peripheral) area. According to his proposal, this functional node is treated as a field consisting of the specification of Force as the external barrier and Fin as the internal one. Force serves as the marker of the ilocutive value of a sentence while Fin integrates the properties of the IP projection dominated by CP, more specifically, its finiteness. These positions would constitute the minimal structure for the CP-field. Nevertheless, CP can also accommodate additional material

corresponding to the position of Topic, expressing topic-comment and Focus, expressing focus-presupposition. The resulting functional structure would be as follows:

(9)   [$_{ForceP}$ Force[$_{TopicP}$ Top[$_{FocusP}$ Foc [$_{FinitenessP}$ Fin … IP]]]]]

In fact, not only the proliferation of functional positions is favored but also the assignment of a pre-established order. Evidence in favor of Rizzi's (1997) proposal can be found in the following examples from Spanish:

(10)   a. Las flores, se las regaló a MARTA.

the flowers, her them give(as a present)-pret.3rd.sg to M.

The flowers, he gave them to Marta.

b. *A MARTA, las flores, se las regaló.

to M., the flowers, her them give(as a present)-pret.3rd.sg

To Marta, the flowers, he gave them to her.

(11)   a. ¿Los libros, dónde los pusiste?

the books, where them put-pret.2nd.sg

The books, where did you put them?

b. *¿Dónde, los libros, los pusiste?

where, the books, them put-pret.2nd.sg

*Where, the books, did you put them?

(10a) and (10b) illustrate that focalized elements follow topicalized elements. At the same time, interrogative elements must follow topicalized elements (11a,b). These examples lead us to deduce that interrogative and focalized elements, due to their quantificational status and to their function as operators, behave similarly and occupy an structural position lower than that of topicalized elements (Rizzi 1997). Following the same trend of thought, it can also be concluded that interrogative and focalized elements never co-appear since they share the same position in the tree, namely SpecFocP (12a,b).

(12)   a. *¿EL PREMIO NOBEL a quién le daremos?   (Spanish)

the prize nobel to whom it give-fut.1st.pl

The Nobel prize, who will we give it to?

b. *¿A quién EL PREMIO NOBEL le daremos?

to whom the prize nobel it give-fut.1st.pl

To whom the Nobel prize will we give it to?

Some other indicators of a pre-existent fixed pattern are the relative order of topicalized constituents and relative operators (13) or finite complementizers that transmit elocutive force (14) with the latter always preceding topics (Hernanz, course lecture):

(13)   a. Un niño que, las acelgas, las odia.   (Spanish)

a boy that, the chards, them hate-pres.3rd.sg

A boy that the chards hate.

b. *Un niño, las acelgas, que las odia.

a boy, the chards, that them hate-pres.3rd.sg

*A boy the chards that hate.

(14)   a. Juan dice   que, de política, sus padres no hablan.   (Spanish)

J. say-pres.3rd.sg that, of politics, his parents not speak-pres.3rd.pl

John says that, about politics, his parents do not speak.

b. *Juan   dice,   de política, que sus padres no hablan.

J. say-pres.3rd.sg, of politics, that his parents not speak-pres.3rd.sg

*John says, about politics, that his parents do not speak.

Consequently, it can also be concluded that relative operators and the finite complementizers occupy a position hierarchically higher (Force) than elements under the domain of Topic or Focus (Rizzi 1997).

Further evidence for a decomposed CP comes from the contrast between partial and total subordinate sentences illustrated in (15) and (16) respectively:

(15)   a. * En Pere pregunta on, de patates, en pot comprar.   (Catalan)

the P. ask-pres.3rd.sg where, of potatoes, clit. can-pres.3rd.sg buy

*Peter ask where, of potatoes, he can buy.

b. En Pere pregunta, de patates, on en pot comprar.

the P. ask-pres.3rd.sg, of potatoes, where clit. can-pres.3rd.sg buy

*Peter asks, of potatoes, where can he buy.

(16)   a. Pregunta-li si, el mocador, també l'hi han regalat.   (Catalan)

ask-imp.2nd.sg-him if, the handkerchief, also him'clit. have-pres.3rd.pl

give-past.participle

*Ask him if, the handkerchief, they have also given her as a present.

b. *??Pregunta-li, el mocador, si també li han regalat.

ask-imp.2nd.sg-him, the handkerchief, if also him have-pres.3rd.pl give-

past.participle

*Ask him, the handkerchief, if they have also given her as a present.

(Villalba 2000)

3. Our proposal

Taking into account the evidence provided in section 2 and the fact that both the minimalist program and cartographical approaches have been shown to share many commonalities (17), we claim that both theories can be accommodated into one single account.

(17)   'There are clear points of connection [between cartographic projects and minimalism], such as the central role of economy considerations and the emphasis on the interfaces' (Rizzi 2004: 5).

The departure point will be that of the Minimalist Program. For every possible utterance, there is a minimal structure compulsorily activated for syntactic processing that includes the core categories C, T, (*v*) and V (in line with Rizzi's Axiom of clausal representation (*apud* Guasti 2002). This structure is always present in every derivation.

(18)   Axiom on clausal representation

CP is the root of all clauses (finite and non-finite)

(Guasti 2002: 142)

Nevertheless, in some cases, such a reduced structure does not seem to be enough as we discussed in section 2. Chomsky (2001) points out the fact that, for some constructions, the schema is shorthand to articulate all the elements for the production of the utterance. Multiple specifier positions are therefore required in the Minimalist Program (see Tree 1 above). Contrary to this, we claim that the elements that enter the numeration activate the projection of additional structure (an additional node projected according to the X-bar scheme) when the minimal representation is not enough to fit in all the material. The order of insertion of the additional nodes corresponds to that provided by the cartographical map.

Therefore, the apparent contrast between the two models is in fact reduced to a matter of 'minimal vs. maximal' representation. In an initial stage, the minimal projection will be activated and enriched until a maximum possible structure (al least from a theoretical perspective) which is contemplated in Cinque's (1999), Belletti's (2004) and Rizzi's (2004) work and is subject to modification with the advance of linguistic research. Such a super-developed structure would only be fully projected if needed.

If we assume that operations such as for example merge (in line with the Complexity Hypothesis (Pancheva & Ullman 2001)) have a cost, this optional activation/projection of functional nodes would derive from an economy principle. In this sense, both theoretical models can be interpreted as the two ends/extremes of a continuum, through out which we found the suitable syntactic positions for representing whatever utterance of any possible language (in line with Newmeyer's (2006) claim that there is convergence between the cartography program and Chomsky's (2002) notion of 'optimal design').

In fact, both the maximal and the minimal structure (tree 2) are seen as default forms. The maximal representation would include all the functional categories available by UG but languages can differ in the number of FCs they implement. This would also affect the minimal representation.According to Rizzi (2005), the inventory of categories which can act as the root of a structure is subject to cross-linguistic variability. Evidence from the need of an specific subset of functional categories for each language out of the total number available at UG can be seen in diachronical studies such as Bartra (2007) who argues after the observation of Bare Noun Phrases in Old Catalan and Spanish that only functional categories from which speakers have formal and morphological information are activated. Another type of study, related to the field of semantics, by Munn and Schmitt (2005) provide evidence in the same direction. The authors claim that languages (in this particular case English and Romance) vary consistently in their need from overt number.

Therefore, what we have called minimal structure can present an even more reduced shape by omitting the projection of nodes higher than the selected root. For cartographical approaches, Focus would be the default root but deeper truncations can be assumed, e.g. TP rooted structures such as yes/no questions in non-impaired adult

Hebrew (according to Friedmann 2001). Even some adult uses of infinitives may be seen as structures rooted lower than Tense if they are assumed to be instances of root infinitives (Rizzi 2005). Hence, what we propose is a continuum from a minimal to a maximal structure (both determined by the language in use) where the selection of functional nodes is crucial for the correct projection of the tree structure. No unnecessary nodes will be activated in the same way that no unnecessary lexical items are selected at the Numeration. The proposal is compatible with an 'omnipotent' view of the lexicon (Borer 2003) which may indicate the nodes an item (either phonologically null or overt) needs in order to be properly projected.

At first sight, a possible shortcoming of our account if only solicited nodes are projected would be the lost of intermediate empty nodes and their possible effect on the sentence. According to Schweikert (2005), Prepositional Phrases are accommodated along a rich array of projections which are hierarchically ordered (19):

(19)   Evidential > Temporal > Locative > Comitative > Benefactive > Reason > Source > Goal > Malefactive > Instrumental/Mean/Path > Matter > Manner.

                                                        (Schweikert 2005)

The relative distance between projections seems to play a central in the interpretation of such forms and their degree of acceptability. In a model that claims that unfilled positions are not projected, this distance will be lost and hence the effect would remain without explanation. Schweikert's (2005) proposal has been criticized for its arbitrarity (Lotfi 2006). Nevertheless, if its validity was proved, that would not constitute a problem for our account since we have claimed that every node relevant for

the representation of a sentence, not only overt material, is solicited by the time of the numeration.

4. Child language and pathological data.

A desirable result of our proposal is the fact that the required syntactic nodes that will play a role in whatever utterance must be selected at some point. Therefore, structural proposals for child and pathological data such as truncated or underspecified structures can be naturally accommodated to this frame. By the time when the numeration is built up, all the syntactic nodes that will be relevant for the speaker's utterance are activated. Failure to activate one of this nodes will derive into reduced structures or the collapse of the derivation.

According to the data, the syntax of child language and agrammatic speech seems to have undergone some reduction process. Cardinaletti and Starke (1994) claim that deficient structures may be due to a 'minimize structure principle':

(20) 'The existence of deficient structure must be attributed to a reduction process in syntax, traced down to a general Minimise structure principle, subsumed under a global economy principle Minimise α (cf. Chomsky's (1993) economy guidelines)'.

(Cardinaletti and Starke 1994: 106)

In the case of infants, syntactic reduction can be attributed to working memory limitations. According to Rizzi (2005), children are subject to these limitations, what may force them to reduce the computational load by dropping material. This option is based on parametric possibilities offered by UG and therefore, its consequences must be

compatible with any theoretical account to be proposed for adult grammars. As working memory capacity increases, child languages becomes more complex till they acquire their particular adult-like characteristics.

Cinque (2004) provides supporting evidence for this hypothesis based on normal acquisition data claiming that adverbs are developed in parallel with the verbal morphology corresponding to the same functional categories. The appearance of the relevant functional heads determines the emergence of adverbs. Mata (2005) tested the comprehension of Speech Act adverbs in 40 bilingual children Catalan-Spanish (10 per age group). The results are represented in Table 1.

Table 1: Adverbial comprehension rates in Catalan and Spanish.

Adverbs	Pragmatic	'of course'	Evaluative	Evidential/Epistemic	Topic or Thematic
3 years	0%	0%	0%	0%	0%
4 years	10%	10%	20%	30%	20%
5 years	30%	40%	40%	60%	50%
6 years	60%	70%	80%	90%	90%

Ten different conditions were tested for each adverb type of the following list:

a. Pragmatic adverbs: frankly, sincerely

b. Adverbs of the type *of course* in Spanish and Catalan (which do not display modality but assertivity).

c. Evaluative adverbs: fortunately

d. Evidential adverbs: evidently, apparently // Epistemic adverbs: maybe, probably.

e. Topic or thematic adverbs: politically, syntactically.

The results show that adverbs appear progressively during the acquisition process, as claimed by Cinque (2004). Additionally, the lower an adverb appear in the tree structure, the sooner it appears in child language.

A similar process can be assumed for agrammatic subjects. If working memory limitations play a role on the deficit, then the option of not projecting a fun-ctional node would be more economical for the system and hence the preferred one. When agrammatic patients recover either through instruction or spontaneously, the increasing complexity of their production can be justified by the improvement/recovery of working memory capacities (reinforcing the idea that functional categories are crucial for recursivity).

In terms of sentence structure, such a parallelism across the two different populations leads us to think that the option of generating structures rooted at low levels of the syntactic tree underlies both non-adult grammars. Child language and agrammatic speech would only differ from their non-impaired adult language counterpart in the permissibility of the system to allow for low-rooted utterances. The model has been represented in Figure 2:

Figure 2: Availability of functional categories.
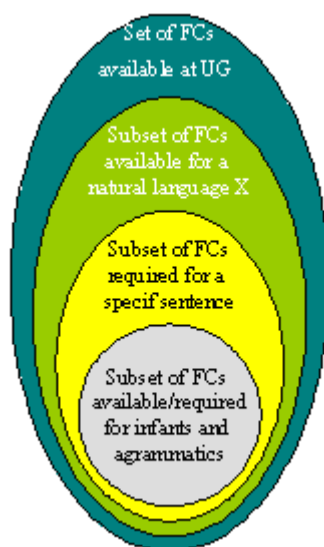
In a model that claims that functional categories have to be solicited[4], failure in the activation of a required projection can be attributed to the underspecification of the functional category in line with underspecification accounts for child data (Wexler 1998) or agrammatism (de Roo 2001). According to our model, the activation of additional structure must always be licensed by the elements entering the numeration; therefore, underspecification of syntactic objects may derive in their inability to introduce the projection of the relevant functional category in the derivation.

Additionally, if a failure to specify one node results in the general collapse of upper parts of the structure, this can be attributed to truncation, i.e. the deletion of one node from the syntactic tree and as a consequence the disappearance of all the nodes immediately higher. Therefore, Rizzi's (1993/4) truncation hypothesis for child language and the so-called Tree-Pruning Hypothesis (see Friedmann's (1994ss) and Friedmann and Grodzinsky's (1997) and much subsequent work) can also be accounted

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[4] It is important to notice that according to this claim all structural positions are optional. The distinction between what Rizzi (2005) considers obligatory positions such as Force or Tense and optional positions required by specific contents such as Topic or Negation no longer exists under this view.

for within the proposed framework.

Rizzi's (1993/4) model departs from the Axiom on clausal representation (CP = root). Nevertheless, Rizzi (1994) claims that this principle is optional in infants. As a consequence, functional projections can be truncated below CP in child language. All the projections above the truncation site are deleted from the representation. AgrP, TP or VP can stand as the root of a clause in child language.

An observation of Tense and Agreement morphology in Catalan children and agrammatics and its deviation from non-impaired adult usages give us some clues at this respect. Davidson and Goldrick (2003) found that T and Agr develop differently in the acquisition process. Data from 2 Catalan monolingual children from the Serrà-Solé corpus (CHILDES database - MacWhinney and Snow 1985) has been included in Table 2.

Table 2: Non-impaired adult like employment of T and Agr.

Catalan data	*Non-present*	*Non-3rd.sg*
Gisela (2;1.23-3;10.2)	28% (149/537)	61% (330/537)
Laura (1;9.7-3;5)	25% (168/682)	50% (341/682)

(Adapted from Davidson and Goldrick 2003)

The authors claim than the presence of agreement morphology is more salient than tense morphology from the beginning. While productive use of T morphology is almost inexistent, Agr starts out at a 50%. A similar dissociation between tense and agreement can also be observed in agrammatic deficits. Gavarró and Martínez- Ferreiro (2007) provide evidence from 7 Catalan agrammatics from the metropolitan area of Barcelona in repetition and completion tasks. The results have been plotted in table 3:

Table 3: Agrammatic production of T and Agr in Catalan

	Tense			*Agreement*		
	Repetition	Completion	Mean %	Repetition	Completion	Mean %
CA	2% (1/50)	20% (10/50)	11%	0% (0/50)	10% (5/50)	5%
CB	24% (12/50)	26% (13/50)	25%	8% (4/50)	6% (3/50)	7%
CC	2% (1/50)	18% (9/50)	10%	0% (0/50)	0% (0/50)	0%
CD	0% (0/50)	10% (5/50)	10%	0% (0/50)	2% (1/50)	1%
CE	6% (3/50)	28% (14/50)	17%	2% (1/50)	12% (6/50)	7%
CF	8% (4/50)	14% (7/50)	11%	0% (0/50)	6% (3/50)	3%
CG	0% (0/50)	10% (5/50)	5%	0% (0/50)	0% (0/50)	0%

(Gavarró and Martínez-Ferreiro 2007)

This dissociation may be seen as a failure to specify tense features or as a collapse of the derivation from agreement nodes upwards. An underspecified tense node will leave us with the syntactic tree in 3 where the area inside the square has not been solicited and therefore, not projected.
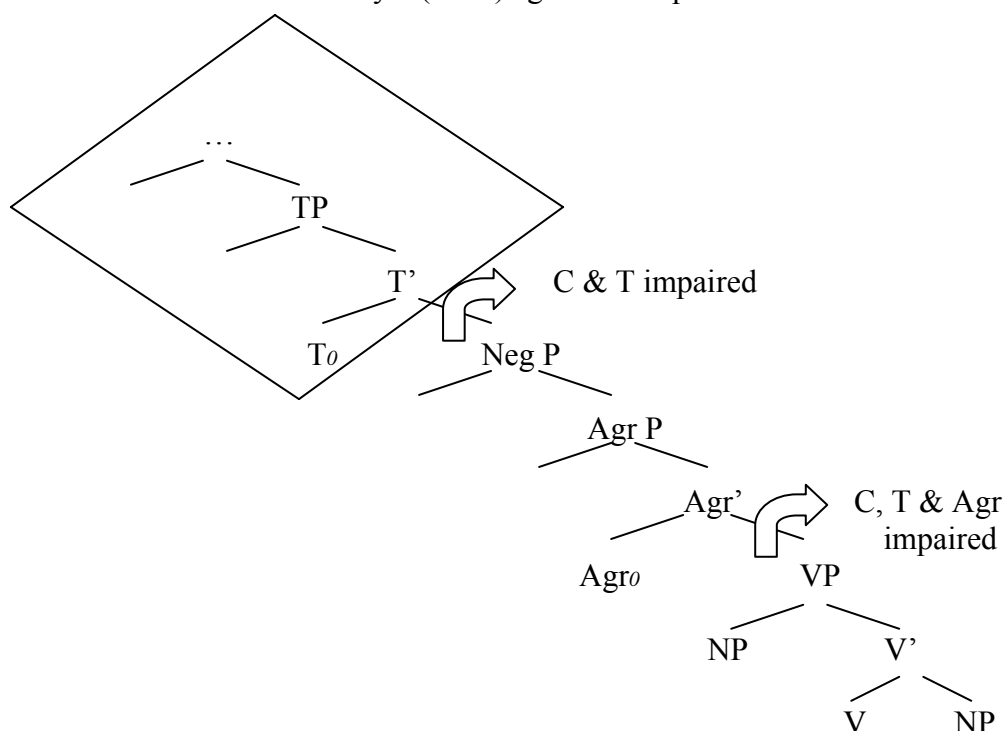
Tree 3: Tense Underspecification
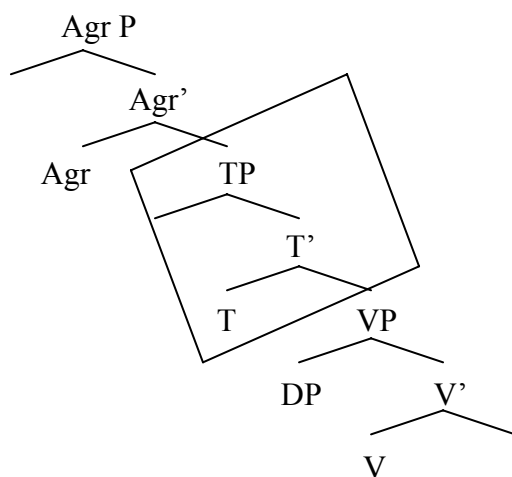
(Adapted from Guasti 2002: 141)

Under a truncation or pruning account, the consequence of that gap would be the total deletion of the nodes located higher than the pruning site, in this case from the T node on.

Tree 4: Friedmann and Grodzinsky's (1997) agrammatic phrase marker

As claimed by Rizzi (1993/4) and Friedmann and Grodzinsky (1997) for child and agrammatic populations respectively, the syntactic representation may appear as rooted in lower nodes than what is expected for non-impaired adults. Additionally, if we take evidence from Cinque (2004) together with data on adverbs presented in this section, CP problems are not only accounted for but also expected under hypothesis. Our account provides a more specific pruning/truncation site since the array of projections is bigger (in line with the cartographical approach). No other adaptation is required for the system to work.

5. Conclusion.

To sum up, in this paper we propose a model that takes syntactic structure as being as reduced as possible for every sentence. The enrichment of this minimal structure is considered a requirement triggered by the elements that enter the numeration. The

relevant nodes to be projected as well as their relative hierarchical order are taken from more enriched cartographical descriptions. Despite this forced enrichment, which may be seen as problematic for both child language and agrammatic speech, the model keeps on being economical in the sense that it provides 'simple and transparent' information to the semantic/pragmatic system (Belletti 2004: 5).

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