The interpretation of discourse categories: Cartography for a crash-proof syntax

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In the cartographic approach to the left periphery, functional heads are assumed to be endowed with features providing transparent instructions for interface interpretation. A direct link between syntax and the semantic-pragmatic level is therefore maintained. This assumption, however, may be challenged by the Inclusiveness Condition: can discourse-related notions be encoded in the grammar as formal features? This paper is intended to provide a positive answer to this question, based on data from typologically different languages. The relevant discussion will also show the advantages of a cartographic analysis to explain language as an "optimal system" in a crash-proof syntax perspective.

1. Introduction[*]

Formal analysis of discourse categories has gained a primary role in linguistic investigation over the last 25 years, under the influential impulse of works by scholars like Horvath (1986) and Brody (1990), showing the essential role played by syntax in the interpretation of discourse-related constituents (Focus, in particular). This interaction has been soon proved to be crucial for a number of genetically unrelated and typologically diverse languages like Hungarian, Modern Greek, Basque, Somali, Korean, Catalan and Finnish (cf. Kiss, ed. 1995).

Faced with data showing the necessity of assuming an extrasentential position for both Focus and Topic constituents, scholars working in the generative framework have generally identified the CP area as the syntactic target for discourse-related A'-movement (also in analogy with wh-movement). As for the position targeted by the relevant constituents, some authors have proposed the existence of novel functional projections (as, for instance, the Focus Phrase, FocP) without, however, considering the general architecture of the C-domain; others have relied on the adjunction strategy, a powerful and unproblematic device which, however, could not account for ordering restrictions within the CP zone.

In 1997, Rizzi's seminal work determined a crucial turn in formal research, shaping the 'fine structure of the Left Periphery' in a cartographic approach, thus providing a way to understand and explain Information Structure (IS) phenomena and the interpretation of discourse categories at the interfaces.

2. The cartographic way to the left periphery

In the cartographic approach to the left periphery, the original CP-node (a recursive phrase, targeted by different functional categories) has been reanalysed as an array of functional projections, each dedicated to a specific IS-related function. The C-domain thus provides an interface between the propositional content (the IP-node) and specific discourse roles. In particular, Rizzi (1997) proposes that the left periphery of the sentence is included between *force* and *finiteness:*

> "Complementizers express the fact that a sentence is a question, a declarative, an exclamative, a relative, a comparative, an adverbial of a certain kind, etc., and can be selected as such by a higher selector. This information is called the specification of Force [...] the C-system expresses a specification of finiteness, which in turns selects an IP system with the characteristics of finiteness: mood distinctions, subject agreement licensing nominative case, overt tense distinctions." (Rizzi 1997: 283, 284)

Force and finiteness can be expressed on a single head "in simple cases", but are forced to split in marked constructions involving "the activation of the Topic-Focus field" (Rizzi 1997: 314). The Force-Fin system thus identified includes a single FocP projection, which is the syntactic locus for [+foc] interpretation, and recursive TopP positions, as Rizzi (1997) assumes that Topics can freely occur in the left periphery both before and after the Focus. In subsequent works it has been proposed that the C-domain also includes a functional projection connected with the interrogative force of the selected clause, called IntP, located in a position higher than FocP (Rizzi 2001). The Force-Fin system can be thus represented as follows (the asterisk indicates recursion):

(1) [ForceP [TopP* [IntP [FocP [TopP* [FinP [IP

Further investigation has then shown that Topics are not freely recursive (Frascarelli and Hinterhölzl 2007, Frascarelli 2007), since specific restrictions can be recognized. In particular, Frascarelli and Hinterhölzl (2007) provide substantial evidence that different Topic constituents are located in specific positions according to their discourse properties. The authors argue for a *systematic correlation* between discourse roles and the formal properties of Topics, which is encoded in a specific ordering of functional heads in the C-domain. In this picture, the Aboutness-Shift (AS-) Topic connects Reinhart's (1981) *aboutness*[1] with the property of being newly introduced or reintroduced and changed to; the Contrastive (C-) Topic induces alternatives in the discourse which have no impact on the Focus value and create oppositional pairs with respect to other Topics; finally, Familiar (Fam-) Topics constitute given information in the discourse context and are used either for topic continuity or to resume background information. Given this characterization, recursion only applies to Familiar

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[1] In particular, Reinhart's 'sentence Topic' identifies the file card under which the information expressed in the following proposition should be stored (update function in the common ground).

Topics, since more than one constituent can be dislocated to retrieve given information. The hierarchy in (1) can be therefore remodelled as in (2):

(2) [ForceP [ShiftP   [ContrP [IntP [FocP [FamP* [FinP [IP

In the present cartographic approach, discourse-related information is implemented in narrow syntax by means of functional features:

> ...this conception makes possible a very transparent approach to the interface between syntax and semantics-pragmatics: peripheral functional heads can be seen as overt "flags" carrying very transparent instructions to the interface systems on how their immediate dependents are to be interpreted. (Cinque and Rizzi 2008, 51)

This means that different types of Focus and Topic are interpreted insofar as they move to (or enter an Agree relation with) dedicated positions in the C-domain in which the relevant features are encoded, as is shown in Table 1 below:

Table 1: The hierarchy of discourse features in the C-domain

C-domain				
ShiftP >	**ContrP >**	**IntP >**	**FocP >**	**FamP***
[+shift]	[+contrast]	[+int]	[+foc]	[aboutness]
[+aboutness]	[given]			[+given]
[given]				

Notice that the interpretation of discourse-related categories can also be *compositional*. The Fam° position, for instance, is endowed with a [+given] feature and bears an unvalued [aboutness] feature. When the latter enters an Agree relation with [+aboutness] in Shift°, it gets valued and the relevant Topic gets a continuing function in the discourse.

Investigation on the left periphery of the sentence has gained significant impulse in the Minimalist framework, given the centrality attributed to *interfaces* (defined as the only "conceptually necessary" levels in Chomsky 1995) and the specification that Internal Merge is connected with scopal features and discourse requirements (cf. Chomsky 2004).

However, a crucial problem emerges with respect to *Inclusiveness* (proposed in Chomsky 1995: 225). This condition requires that the output of a system does not contain anything beyond its input: it is thus taken to imply that the interface levels contain nothing more than arrangements of lexical features. The question therefore arises as to what evidence can be provided to assume that discourse features represent properties of the lexical items. The discussion of data relevant to this point will be preceded by a (short) illustration of an approach alternative to cartography.

3. The Modular Hypothesis for discourse features
Recent analyses have proposed an interface-driven approach to the interpretation of discourse categories, such that no direct link can be assumed between syntax and information structure. This means that no IS notion – i.e., *purely discourse-*

related notions[2] (cf. Horvath 2010) – can be encoded in the grammar as a formal feature; as a consequence, there can be no feature-driven 'focus movement' or 'topicalization':

> The use of focus/topic features in the syntactic derivation violates the inclusiveness condition (Chomsky 1995), according to which only those features can figure in syntactic computations that represent properties of lexical items. On obvious grounds, being a focus or a topic is not a lexical property— words and phrases can be classified as such only when used in a specific context. (Fanselow and Lenertová 2011, 173)

From this perspective, movement to the left periphery is triggered by an unspecific 'edge feature' of C (cf. Chomsky 2008) and its restrictions can be attributed to the requirements of cyclic linearization (cf. Fox and Pesetsky 2005). In particular, Fanselow and Lenertová (2010) propose that "accentuation rather than informational status determines which categories can be fronted" (p.170). The special role attributed to accentuation, however, does not imply a prosody-driven syntax; rather it stems from the fact that accentuation is a "side-effect of cyclic linearization".

Given cyclic access to the interfaces at every phase boundary, non-feature driven movements are triggered by *interface requirements* of either the PF component (Fanselow and Lenertová 2010) or the interpretive components (Horvath 2010; Neeleman and van de Koot 2008). In other words, according to this approach *the syntax is blind* to the realization of discourse-related phenomena: it will freely generate structures among which uninterpretable ones will be *filtered out* at the interface(s).

4. Discourse-related notions as syntactic features: the data

The assumption that discourse-related features are part of the functional lexicon can be empirically supported by two classes of fact, namely (i) the existence of overt discourse markers in the C-domain inducing specific interpretations and (ii) the limits of a pure 'formal fronting' approach to explain the (un)grammaticality of certain movement operations (i.e., the necessary attribution of a specification to the 'edge feature'). The next two sections will be dedicated to the illustration of cross-linguistic evidence in both directions.

4.1 Discourse-related markers

A Focus-prominent language like Somali seems to provide substantial evidence in favor of a lexical specification of discourse-related notions. Let us consider the realization of yes-no questions (from Frascarelli and Puglielli 2007):

(3) a.   *Cali*   ***ma***   HADIYAD ***buu*** *(baa+uu) keenáy?*
          Cali   QM   present   FM.3SGM   bring.PST.3SGM
          'Is it a present that Cali brought?'

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[2] "What I mean by this term [i.e., purely discourse-related notions] is notions whose interpretation is not actively involved in the formal semantic interpretation of the sentence but only in information structure. Specifically, they are neither truth-conditionally relevant features of lexical items, as e.g. the inflectional features of person or number on nominals, nor quantificational functional elements with truth-conditional effects active in formal semantics, such as generalized quantifiers, known to be non-referential, to exhibit scope interactions and weak crossover effects." (Horvath 2010: 1349)

     b.   *ma HADIYAD buu Cali keenáy?*

     c.   **Cali HADIYAD buu ma keenáy?*

As we can see, yes-no questions require the presence of two discourse markers: the Question marker (QM) *ma*, which must be located immediately before the constituent under question, and the Focus marker (FM) *baa*, immediately following it. In other words, *ma* and *baa* must be used in combination to obtain the intended interpretation. It is thus feasible to propose that *ma* and *baa* are lexicalizations of discourse-related features ([+int] and [+foc] respectively), merged in specific functional projections (which can be identified with IntP and FocP).

The realization of wh-questions and, in particular, the internal structure of wh-phrases strongly supports the present hypothesis.

Given the information-structural parallelism between Foci and wh-constituents (they are both syntactic operators connected with new information), in the cartographic tradition FocP has very often been considered a sort of a 'multifunctional' projection targeted by either Foci or wh-phrases. Fanselow and Lenertová (2011: 173), on the other hand, argue that left-peripheral movement and *wh*-movement differ in a number of important respects (locality constraints, standard conditions on pied-piping, and so on); moreover, *wh*-movement is obligatory in the majority of languages, while Topic/Focus fronting to SpecCP is very often optional. These differences lead the authors to claim that the two processes cannot be equated.

Somali data, however, show that the interpretation of (genuine) wh-questions not only depends on the movement of a wh-phrase into a specific position in the C-domain where the [+int] feature is located but also, and crucially, on its interaction with [+foc]. Consider the following sentences:

(4)   *Cali   muxuu   (ma+wax+baa+uu)   cunay?*
      Cali   QM.thing.FM.3SGM   eat.PST.1SG
      'What did Cali eat?'

As we can see, the wh-phrase *maxaa* ('what') is obtained through the combination of the Question and the Focus markers with the generic NP *wax* ('thing'). This shows that wh-constituents are not lexically specified for a discourse feature connected with question, even though they are potential candidates for expressing such discourse property. Wh-phrases (indefinite constituents *per se*) are endowed with an unvalued [int] feature and assume a genuine (i.e., information-seeking) interrogative force only if they *check* this feature in the appropriate position and *combine* it with [+foc] in the C-domain.[3] To this purpose, an Agree relation can be profitably assumed between Int° and Foc°.

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[3] In this respect, it is interesting to notice that in indirect questions the two markers at issue are not realized on the embedded wh-phrase, which is only lexically defined by the generic NP *wax*:
(i) *Waxaan   irahdo   ma   aqaan.*
     thing.SCL.1SG say.DEP   NEG   know.NEG.1SG
     'I don't know what to say.'
The sensitivity of discourse-related notions to the root/non-root distinction will be addressed below.

Evidence in this direction is also provided for force-related features in Somali. The distinction between root and non-root clauses has been widely debated in the literature (Hooper and Thomson 1973, Haegeman 2002, Emonds 2004, Heycock 2006, Bianchi and Frascarelli 2010a, among many others) and the existence of phenomena restricted to root contexts is commonly assumed. It is therefore interesting to notice that in Somali declarative main clauses (i.e., assertions) require the presence of a marker in the C-domain (*waa*, defined as a "declarative marker" in Frascarelli and Puglielli 2007), which cannot be found, for instance, embedded under factive or volitional verbs (Puglielli and Frascarelli 2011):

(5) a. *In-uu*   *Axmed*   (**waa*)   *dhoofo´*   **(waan)*
         that-SCL.3SGM   Axmed   DECL   leave.DEP.3SGM DECL.SCL.1SG
         ka   xumahay.
         from   be.sorry.PRES.PROG.1SG
         'I am sorry that Axmed is leaving.'
     b. *In-ay*   (**waa*)   *timid*   **(waan)*
         that-SCL.3SGF DECL   come.DEP.3SGF   DECL.SCL.1SG
         rajeynayaa.
         hope.PRES.PROG.1SG
         'I hope she will come.'

Additional evidence for discourse- and force-related markers to be stored in the lexicon comes from the realization of *wa*-marked Topics in Japanese (a root phenomenon, cf. Kuno 1973).[4] In Japanese the realization of complementizers is sensitive to the root/non-root distinction so that, for instance, embedded clauses are introduced by either *koto* or *to*, depending on the factive vs. non-factive nature of the matrix predicate (Kuno 1973). Miyagawa (2011) shows that *to*, the non-factive complementizer, is a force-related marker compatible with assertion, since the complements of non-factive predicates allow Topics marked with –*wa*:

(6) *Hanako-wa*   [*pizza-wa Taroo-ga   tabeta   to*]   *itta.*
     Hanako-TM   pizza-TM Taro-NOM eat.PST   NONFACT   say.PST
     'Hanako, (he) said that pizza, Taro ate.'

On the other hand, verbs like *regret* only allow the *koto* (factive) complementizer, and the Topic marker (TM) –*wa* cannot be realized. As shown in (7), in that case the accusative marker –*o* must occur, which indicates a different type of movement for *kono hon* ('this book') in the embedded C-domain, namely scrambling (cf. Maki et al. 1999):

(7) *John-wa* [*kono hon-*wa/-o   zibun-no-kodomo-ga   yonda koto*]-*o*
     kookaisita
     John-TM   book this-TM/-ACC   self-GEN-child-NOM   read   FACT-ACC
     regret
     'John regrets that this book, his child read.'

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[4] In particular, the discourse properties of *wa*-marked Topics in Japanese characterize them as AS-Topics (cf. § 2). For this reason they should not be confused with NPs marked by contrastive–*wa*, which have different prosody (the relevant -*wa* being stressed) and distribution (cf. Kuno 1973).

It should be finally noticed that the embedded clause in (7) shows the accusative marker -*o*, which is not present at the end of the non-factive clause in (6). This seems to show that a factive CP is indeed a complement of the main clause, while non-factive CPs are not really subordinated, though they realize an argument of the root predicate and are located in the (preverbal) position dedicated to objects in Japanese (cf. (6)). In this respect they can be compared to complement clauses in direct speech contexts which, as is argued in Bianchi and Frascarelli (2010b), allow for root phenomena like LD in English. Consider (8) below:

(8)   "I ain't saying' for you to stay" said Grampa. "You go right on along. *Me –* I'm stayin'." (J. Steinbeck, *The Grapes of Wrath*, Penguin Books, p. 143)

Further considerations and a deeper analysis of these phenomena are beyond the scope of this paper and are left for future works.

4.2 Discourse-related movement in a 'pure fronting' approach
One of the most well-known cases of discourse-related fronting is the so called 'ex situ strategy' of Focus, which requires movement of the focused constituent to a position immediately preceding the verb (or the 'verbal complex', cf. Frascarelli 2010) in the left periphery.

A number of Focus-prominent languages (like Somali, Kikuyu, Yoruba, Hungarian and Sicilian, among others) use this strategy to realize both information and contrastive Focus in main clauses, while Focus fronting in embedded clauses is only associated to a contrastive interpretation. This means that sentences like (9A') and (10A') below, respectively from Sicilian (Cruschina 2006) and Hungarian (Liptak, p.c.), cannot be used to answer a yes-no question:

(9)   Q: What did you say that he bought?
      A: *NA   MACHINA   dissi   ca   s'   accatta'*
          a   car   say.1SG.PST that REFL   buy.3SG.PST
          'I said that he bought A CAR.'
      A'. *#Dissi   ca   NA   MACHINA   s'   accatta'*
          say.1SG.PST that a   car   REFL   buy.3SG.PST

(10) Q: Who does János want us to invite for dinner?
      A: *János   JULISKÁT   akarja   hogy   hívjuk   meg vacsorára*
          János   JULIE.ACC   want.3SG that   invite.1PL PV   dinner.for
          'János wants that we invite JULIE for dinner'
      A'. *#János   azt   akarja,   hogy JULISKÁT   hívjuk   meg vacsorára*
          János   DEM.ACC   want.3SG that JULIE.ACC   invite.1PL PV
          dinner.for

The interpretation of discourse-related categories thus seems to be linked to specific syntactic positions.

As for intonation, recent analyses have shown that the focused phrase is generally marked by a high pitch accent (H*), independent of its contrastive vs. information nature. Specifically, a pitch-accented fronted Focus in Somali has the

FM *baa* cliticized onto it, while the following (presuppositional) material stays on a low tone (which corresponds to the speaker's baseline; cf. Frascarelli and Puglielli 2009). These PF properties characterize both information and contrastive Foci; nevertheless, information Focus is banned in embedded contexts.

This asymmetry can be easily explained in a framework assuming a different array of functional projections in root and embedded CPs, capitalizing on the fact that a number of discourse-related features are only available in main clauses. On the contrary, in a theory excluding a direct link between syntax and IS requirements, it is difficult to define the interface filter excluding an 'accentuated' information Focus in embedded clauses.

A similar case has been recently discussed by Bianchi and Frascarelli (2012) on V2 fronting in German. Working on root transformations which have an impact on IS, Bianchi and Frascarelli distinguish two subtypes of root phenomena, depending on their scopal interaction with matrix clause elements and their distribution in declarative complement clauses. Specifically focusing on German V2, they showed that this operation can occur in complements to volitional verbs independent of the discourse role of the fronted element. This seems to show that syntax is indifferent to whether the fronted phrase has a contrastive Focus or Topic reading (cf. (11)) and the relevant movement might be fairly attributed to cyclic linearization:

(11) a.   CONTRASTIVE FOCUS INTERPRETATION
     Ich wünschte, meine Fehler hätte ich rechtzeitig erkannt,   nicht nur meine
     I   wish,   my   errors   have I   in time acknowledged not only my
     Mängel.
     faults

     b.   CONTRASTIVE TOPIC INTERPRETATION
     Ich wünschte, meine Fehler hätte ich rechtzeitig erkannt   und meine Wünsche
     I wish,   my errors   have I in time acknowledged and my   wishes
     realisiert.
     realised

In the case of complements to factive verbs, however, V2 is only accepted with a contrastive Topic interpretation (though marginally, cf. (12b)), and is excluded with a contrastive Focus reading (12a):

(12) a.   CONTRASTIVE FOCUS INTERPRETATION
     *Es freut mich, seinen undankbaren   Job hat Hans endlich gewechselt,
      it   pleases me, his unrewarding   job has Hans finally   changed,
     nicht seinen   Beruf.
      not   his   profession

     b.   CONTRASTIVE TOPIC INTERPRETATION[??]
     Es freut mich,   seinen undankbaren Job hat Hans endlich gewechselt
      it   pleases me, his   unrewarding job has Hans finally changed
     und   den   alten   Direktor   hat er in die   Wüste   geschickt.
      and   his   old   boss   has he in the   desert   sent

This last piece of evidence shows that the contrastive Topic interpretation (at least) *favors* V2 fronting in factive complements and shows, once more, that IS requirements play a direct role in the syntax.

   In the last part of this section we will finally consider evidence from 'split NP' fronting in Ukrainian. This phenomenon, also attested in languages like Russian, Czech, Bulgarian and German, concerns the possibility to separate an adjective from the head-noun it modifies and move either one to the C-domain for IS requirements. In Ukrainian this construction is used to realize both Topic and Focus constructions, the relevant interpretation being dependent on formal (syntax-prosody) properties. Consider the following sentences (from Shvets 2012):

(13) *V xati,*   *dity*   *spaly*   *v*   *xolodnij.*
      in house.F.SG.LOC child.PL.NOM   sleep.DUR.PST.3PL in   cold.F.SG.LOC
      lit.: In house, the children slept in cold
      'As for the house, the children slept in a cold one.'

(14) *V XATI*   *spaly*   *dity*   *v*   *xolodnij.*
      in house.F.SG.LOC sleep.DUR.PST.3PL child.PL.NOM   in   cold.F.SG.LOC
      lit.: IN HOUSE slept the children in cold
      'The children slept in a cold HOUSE.'

(15) *V XOLODNIJ*   *spaly*   *dity*   *(v)*   *xati.*
      in cold.F.SG.LOC   sleep.DUR.PST.3PL child.PL.NOM   (in)   house.F.SG.LOC
      lit.: IN COLD slept the children (in) house
      'The children slept in a COLD house.'

As we can see, fronting of a split PP with a Topic interpretation (13) does not interfere with the unmarked word order of constituents in the sentence (SVO in Ukrainian), while split Focus fronting (14)-(15) is associated with an adjacency condition by the part of the verb (as is the case in a number of typologically different languages; cf. Frascarelli 2010). Moreover, the fronted (split) Focus is always marked with a H* tone, while a Topic is generally realized with a raising tone (probably depending on the specific Topic reading – an issue which we leave open here). Finally, in the case of Focus the modifier can also be split and fronted (cf. (15)), while this is not the case for topicalization.[5]

   Moreover, split fronting with a Focus reading seems to be associated to a specific type of contrastive interpretation, which implies a *correction* (cf. Bianchi and Bocci 2011). Indeed, given a context like (16A) below, it is impossible to Focus the adjectival modifier in situ, producing a sentence like (16B') (which is otherwise grammatical, as shown in (13) above):

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[5] Focus fronting presents additional intricacies related to the doubling of the preposition – obligatory when the head is fronted (cf. (14)), optional in the case of modifier fronting (cf. (15)). This interesting issue is left open for future research.

(16) A: I heard that the house where the children slept in the weekend was very
        warm.

     B: *Ni, v XOLODNIJ*   *spaly*   *dity*   *(v) xati*
        No, in cold.F.SG.LOC   sleep.DUR.PST.3PL   child.PL.NOM   (in)
        house.F.SG.LOC
        'No, the children slept in a COLD house.'

     B'. **Ni, v xati dity spaly v XOLODNIJ.*

In other words, though in (16B') topicalization of *v xati* should satisfy
accentuation requirements (in Fanselow and Lenertová's 2011 terms), the
realization of an *in situ* corrective Focus makes the relevant sentence
ungrammatical.

     Cyclic linearization thus seems to be inadequate to provide a full
characterization of the split NP phenomenon in Ukrainian, whose formal
properties and restrictions are clearly sensible to IS-distinctions and interpretive
requirements.

5. Conclusions and final considerations

The data discussed in sections 4.1 and 4.2 suggest that discourse-related features
should indeed be considered as part of the functional lexicon, fully complying
with Inclusiveness and Economy.

     As a matter of fact, if the central premise of Minimalism is that language is an
optimal system (cf. Chomsky 1995), a strictly cyclic approach to IS-related
movement does not seem to offer the best solution. Indeed, if syntax is blind to
discourse-related operations, these are assumed to occur freely and cannot be
interpreted at the interfaces until the root CP phase has been completed. Only at
that point is it possible to determine whether an operation is licensed or not and, if
this is not the case, the relevant structure will be filtered out. In this picture,
syntax is clearly burdened by an over-generation of (possibly) illicit IS-related
operations.

     In a cartographic approach, on the other hand, IS-related features are part of
the lexical endowment of functional projections, providing clear instructions to
obtain interpretation at the interfaces. From this perspective, discourse-related
phenomena are generated by a *crash-proof syntax*, thus accounting for structural
restrictions and allowing for important cross-linguistic predictions. To conclude,
in a minimalist perspective a cartographic implementation should be preferred
over a pragmatic filtering approach. Future research should therefore be dedicated
to provide an accurate definition of the functional array of root and embedded C-
domains, which can explain interface requirements and interpretation in the
optimal system that Minimalism seeks to explore.

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