Internal Merge Beyond Explanatory Adequacy

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Abstract

In this paper I will analyze the conceptual and computational motivations of the property of *displacement* in natural languages as part of the attempt to develop a "Radical Theory for the Minimalist Program". I will account for *displacement* phenomena proposing my own version of *displacement-as-external token Merge*, as opposed to the traditional *displacement-as-literal movement* or, more recently, *displacement-as-copy and Merge* (Chomsky, 1995; Nunes, 2004). Going *Beyond Explanatory Adequacy* is a notion I will understand here as aiming to grasp the ultimate motivations of phenomena in terms of bare *interface requirements* in the context of a *massively modular mind-brain*.

Keywords: Radical Minimalism, Movement, Syntax-Semantics interface, Free Merge, Type-Token

1. Outlining the framework

To begin with, I must outline the framework within which I will be working: *Radical Minimalism*. It is a theory within the Minimalist Program that attempts to provide *principled* explanations for linguistic phenomena without ignoring interaction between mental faculties or biological-computational plausibility and, perhaps most importantly of all, seeking the elimination of all intra-theoretical stipulations via interface conditions and (I will claim, *universal*) economy principles. Let us review some of the basic tenets of radical minimalism, and then discuss the framework:

(1) Language is part of the "natural world"; therefore, it is fundamentally a physical system.

(2) As a consequence of 1, it shares the basic properties of physical systems and the same principles can be applied (*indeterminacy*, the *Conservation Principle*, *locality*, etc.), the only difference being the properties of the elements that are manipulated in the relevant system.

(3) The operations are taken to be very basic, simple and universal, as well as the constraints upon them, which are determined by the interaction with other systems, not by stipulative intra-theoretical filters.

(4) 2 and 3 can be summarized as follows:

Strong Radically Minimalist thesis (SRMT):

All differences between physical systems are "superficial" and rely only on the characteristics of their basic units [i.e., the elements that are manipulated], *which require minimal adjustments in the* ***formulation*** *of operations and constraints* [that is, only notational issues]. *At a* ***principled level****, all physical systems are identical, make use of the same operations and respond to the same principles.*

From SRMT, the regularities that have been found regarding the structure of each faculty in the context of a massively modular mind follow straightforwardly (Katz & Pesetsky's, 2011 "*Identity Thesis*" as an example), as well as the parallels existing between subpersonal systems (i.e., mental faculties) and other biological / physical systems (see Uriagereka, 1998 for some examples and references). It seems relevant to insist on the fact that I am not making

a *reduction* of biology (as language is ultimately a biological system, if Chomsky's claim that language is a natural object is accepted) to physics (and that my use of RM in mathematics and physics is ***not a metaphor***), but simply analyzing a *biological* phenomenon in physical terms, as a physical system (in which there is no contradiction whatsoever) and, as such, applying the *tools* that have been devised in physics in the degree that it is possible, and without confusing the *methodological* tools with *substantive* elements. Of course, looking for exact correlates between *any* two fields would be irrational in the *substantive* level (i.e, units of analysis, as Poppel & Embick, 2005 correctly point out), but I put forth that the *methodological level* has much to tell us, as they are all "parcels" of the same Universe that, I tried to show in our previous work and will also argue here, are ***identical in a principled level of abstraction***. Therefore, I claim that *computational* properties (i.e., Merge) can be formulated substrate-neutrally. I will focus on the human mind-brain, but my hypothesis is much less restricted.

I claim that there is *only one* generative operation (in the physical world in general, in the mind-brain in particular), namely *Merge*, which is free, "blind" (that is, insensitive to the *characteristics* of the objects it manipulates, I follow and extend the thesis of Boeckx, 2010 that only *format* is relevant) and unbounded, and an operation *Transfer* that provides us with a way of delivering structured information across modules. Merge is an inherently diachronic operation that generates binary-branched hierarchical structures, endocentricity being merely a C-I interface requirement in the case of what has been called the Faculty of Language (FL). Transfer takes place as soon as it can, and this timing is determined by the formation of a

fully interpretable configuration in terms of "bare output conditions", what I call a *phase*[1]. Formally, Merge has the form of a *concatenation function* that applies to objects in an *n*-dimensional workspace W:

(1) *Concatenation* defines a *chain* of coordinates in *n*-dimensional generative workspaces W of the form $\{(x, y, z\ldots n)W_X \ldots (x, y, z\ldots n)W_Y\ldots(x, y, z\ldots n)W_n\}$ where $W_Y \equiv W_X \equiv W_n$ or $W_Y \neq W_X \neq W_n$. If $W_X \neq W_Y$, they must be isodimensional.

So far, I have described what Phoevos Panagiotidis has humorously called a "dumb machine" (p.c.), a computational system whose material instantiation is something irrelevant: there will always be, by conceptual necessity, a generative operation and the possibility of sharing information in the form of structured symbolic representations. This mechanism is "dumb" in as much as it is insensitive to the properties of the elements it manipulates: elements are put together in the working area of a determined module because they share a "common format" (Boeckx, 2010), regardless of the characteristics of these elements, and even the characteristics of the resultant object. From this it follows that *there is no "ill-formation" in the syntax, but only in the interface levels*, if a transferred configuration does not allow the licensing of a given dimension, or no explicature can be built with the instructions provided by the syntax in the form of a Logic Form (in Relevance Theory's terms) representation.

In a "dumb syntax" there are no constraints at all, so there is no point in positing feature-driven operations as it represents a substantive complication of the theory, rather than being the null hypothesis. Merge applies because two whichever objects share a common format, and Transfer applies as soon as interface conditions allow it: necessary conditions are

[1] Cf. the orthodox view on Chomsky, 1998, 1999, 2001, 2005a.

also sufficient conditions for Merge to apply in our free system. The role of features, which has been one of extreme importance in Minimalist syntax[2], is questioned, and the very notion of feature is put to test. My argument goes as follows: let us start with a fully interpretable Relational Semantic Structure (see Mateu, 2000a, b for the original presentation, Krivochen 2010b, d for developments within this framework), built by merging *generic concepts* in the pre-syntactic instance of C-I. According to the *Conservation Principle* (Krivochen, 2011b), information must be carried along the whole derivational path (i.e., information cannot be erased, but instantiated in a way so that it can be manipulated by the relevant module), which implies that the concepts will have to be instantiated in such a way that they can be manipulated by the syntax, those concepts take the form of *roots*. So far, no features or procedural instructions are in play, only conceptual primitives. Apparently, features should be added at this point in the derivation, when a semantic object is transformed into a syntactic object. (Un-)Interpretability depends on valuation (Chomsky, 1999), and valuation depends on the category on which they appear. Those features that enter to the derivation unvalued in a category must be eliminated for the derivation to converge. Our objection here is: why adding features in the first place if the system will then eliminate (some of) them? This, without taking into account the stipulation that underlies the whole system regarding the fact that a feature [X] enters the derivation valued in category P but not in category Q. Even if the reader does not accept our use of the Conservation Principle, this second objection is valid within an orthodox Minimalist framework. Feature valuation-deletion also entails the following problem, first noticed by Epstein & Seeley (2002): *the timing of Spell-Out*. If the

[2] For an exhaustive analysis and references, see Adger (2010), Adger & Svenonius (2009).

orthodox view that Spell-Out deletes the features that are uninterpretable by LF is accepted, (i.e., those which have entered the derivation unvalued, and have therefore acted as *probes*, copying the value of a c-commanded *goal*) then the system must be told which of all the features that appear in a certain derivational point had entered the derivation unvalued. But, in order to do so, it would have to look back and see the derivational point immediately before valuation, which is impossible in a derivational (even if it is not as strong as Epstein's 1999) approach as the derivation is a diachronic process, and past states of the system are no longer accessible. The situation can be summarized as follows:

Spell-Out timing:

a) Prior to valuation. Result: *crash*. Uninterpretable features get to the interface levels.

b) After valuation. Result: *crash*. There is no way of knowing which features entered the derivation unvalued (and were, therefore, uninterpretable by LF).

Chomsky (1999) attempted to solve the problem by stipulating that Spell-Out (i.e., *Transfer* to PF) takes place "shortly after" valuation, but I do not see how this could help solving the problem. Epstein & Seeley also tried to provide an explanation by saying that the transference took place *within a transformational cycle*, that is, not before, not after valuation, but *during the process*. For us, that is not a satisfactory answer, since it is simply not principled, but stated. My solution is quite more radical: I just *eliminate features from the picture*. My proposal is the following: instead of binary-valued dimensions, there are only primitive dimensions with procedural value (Case, to give a well-known example) that can adopt a number X of values, in this case, 3: Nominative, Accusative and Dative (Krivochen, 2010c).

In isolation, the relevant dimension will *comprise all three values* because if all three outcomes are possible states of the system, their linear combination is a possible state if the system as well. The relevant dimension will then be in what I call (following Quantum Mechanics) the *ψ-state*. The ψ-state of the Case dimension would be something like this:

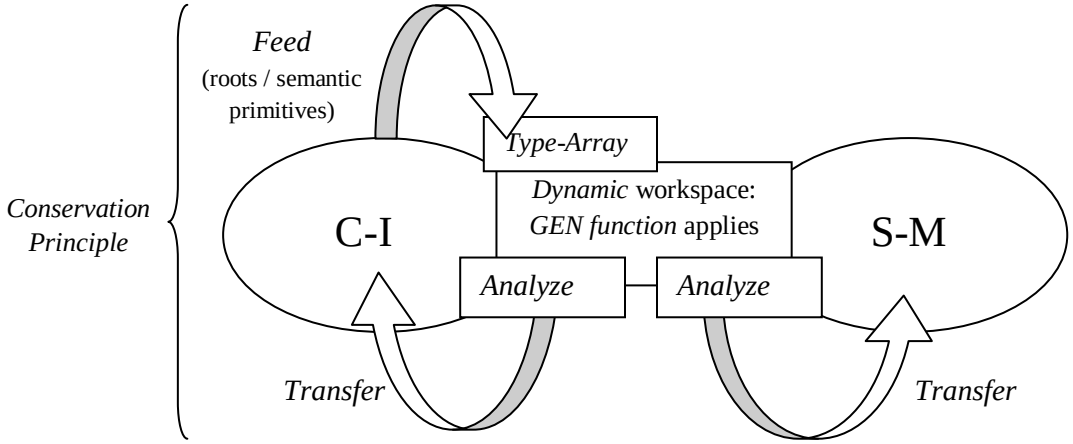
(2) $[\text{Case}_X] \longrightarrow N\varphi + A\theta + D\lambda$

The system can manipulate an element with a dimension in its ψ-state (as it is blind to the characteristics –i.e., "features"- of the elements it manipulates *but* ***format***), but there will be a collapse at LF (understood in Relevance Theoretic terms, as an incomplete propositional form, with referential –either eventive or sortal- variables to be further specified), since the procedural contribution of the dimension will be the same as null as no mental module can interpret ψ-states (see Schrödinger, 1935 for a simple but extremely clear and useful example). That state will hold only if the element is not inserted in a syntactic (i.e., structural) configuration, in which it appears in a Minimal Configuration (Rizzi, 2004) with a *procedural* node. The functional head in a local relation with the dimension makes it collapse to one of its possible states depending on the "interpretable" procedural semantic features it carries. Therefore, if the procedural head in question is P, to take an example, the closest $[\text{Case}_X]$ dimension will be *collapsed* to the Dλ state, namely, the *Dative Sphere*. The advantages of this view are clear: there are neither *probes* and *goals*, nor the stipulation that the same dimension be in both. No more *valuation* / *interpretability* problem, no more stipulations as regards where features are or any of the concomitant proposals (feature inheritance / sharing, etc.). Besides, I agree with Cedric Boeckx in that, if syntax is really *free*, Agree is a(n *unprincipled*) form of constraining it, which goes against Radically Minimalist desiderata. As

I already claimed in Krivochen (2011b), the correlations (*Split*)T-Nom, cause-Acc and P-Dat can be derived from independent interface requirements, the dynamics of the derivation in interaction with bare output conditions. In our architecture, then, syntax may be blind, but C-I is certainly *not*[3]. The C-I interpretative system, which in massive modular models of the mind takes most of the functions of Fodor's (1983) central processor, not only *drives* syntactic derivations (as the Conservation Principle predicts) but it is in itself a *generative* W: complex conceptual structures (of the kind described by Jackendoff, 1990, 2002 for example), are built by *Merge*, in consonance with our claim that Merge is the one and only generative mechanism in the physical world, and thus in the human mind. Of course, it may be claimed that very little is known about C-I (or the Universe in general) to make such assumptions, but what I am doing here is inferring what characteristics it should have if it is the case that *the mind-brain can actually described and explained in terms of Radical Minimalism*. Whether it is or not, is still to be empirically proven. The architecture I argue for looks as follows (taken from Krivochen & Kosta, in press):

[3] We will not address in depth here the question whether C-I is computational (i.e., "generative" in some way) or not. Fodor (2000) and Panagiotidis (p.c.) argue against it. We claim (quite in the line of Jackendoff, 1983 and building on ideas from Mateu, 2000) that there are purely conceptual structures that, even though they *can* be instantiated linguistically, they are not linguistic in nature. Our view clearly contradicts the conception about the semantic component that has been accepted since early Generativism (see Chomsky, 1965, for example), namely, it is *only interpretative*. For us, there is *syntax* in every module that deals with *structured symbolic representations*, therefore, C-I *must* be computational.

(3)



2. External Merge theory of Movement and the *type-token* relation

In this section, I will show that understanding Move in terms of *actual displacement* (as in the GB model) violates the *Inclusiveness Condition* (IC), introducing not only new elements in the derivation, but also a new set of principles to rule dependencies between the moved element and the trace left behind, which is a different element. In Chomsky (1998) the *Copy Theory of Movement* is explained in length, pointing out that having Copies instead of Traces goes better with theta-theoretic considerations and it would not violate the IC (see also Nunes, 2004 for a clear presentation of the theory). However, there are still extra elements: numerical sub indexes in the NUM. Let us assume now that there is no NUM (i.e., no numerical subindexes), but simply an *Array*, selected according the mechanism explained in length in Krivochen (2011a et. seq.), consisting on *types*, of which an (*a priori*) unlimited number of *tokens* could in principle be realized in the syntactic workspace. Let us work with the following set of assumptions:

(4) A *type* is an abstract element in a physical system Φ.

(5) LEX_S is the full set of *type*-symbols that can be manipulated by a computational system S, which is a generative W. An *Array* is a set A of *types* such that $A \subset LEX_S$.

(6) A *token* is an occurrence of a *type* within W_X. There are no *a priori* limits to the times a *type* can be instantiated as a *token* but those required by Interface Conditions IC.

(7) If α and β are interface-associated via their coordinates in W, there exists a *Dependency* between α and β.

(8) If $\alpha \in W_X \wedge \beta \in W_Y$ and either $W_X \equiv W_Y$ or $W_X \not\equiv W_Y$ and α and β are defined by the same *n*-plet of coordinates in their respective *isodimensional* Ws, α and β are *bound* and the *dependency* is called *co-referentiality*.

Move, then, is just and simply *External Merge a token from the type-Array*. The number of tokens required is determined by interface conditions, so that the *minimal number* of tokens leading to a convergent object is used, provided that the notion of "convergent object" does not arise from look ahead (the syntactic component looking at the legibility conditions of the interface systems, which would lead us to a "bad" crash-proof system), but rather from the interfaces "peering into" the syntax (something similar to the proposal by Boeckx, 2007, although the consequences he draws are completely different from mine) and *Analyzing* whether a syntactic object is ready to be transferred (Krivochen, 2011d, Kosta & Krivochen, 2011). A strong version of our proposal allows us to dispense with the very notion of movement in terms of actual "displacement". Let us assume that an *Array* contains *types* of units (whose conceptual or procedural nature will be identified at the semantic interface, this is why I avoid the term *Lexical Array*), not *tokens*, as it is commonly assumed. If this is

correct, then I could put forth the idea that there is no upper bound on occurrences of a type in a derivation (i.e., the number of times it is instantiated as a token) beyond what is required by the *Conservation Principle* and *Dynamic Full Interpretation*. The very elements of the *Array* are instantiations of the elements present in the purely conceptual Relational Semantic Structure (Mateu, 2000a, b) –very reminiscent of Jackendoff's (1983 et. seq.) Tiers-, but they are types, therefore, *no numeric sub-indexes are needed*. There is no movement in terms of actual displacement if one considers that all Merge is external Merge, instead of moving (i.e., displacing) a syntactic object, the system, driven by interface necessity, can simply draw another instance (i.e., token) of that object from the Array and Merge it externally, the process occurring over and over again until no further instances of that SO are required by C-I to build an explicature (i.e., a fully-fledged propositional form with satisfied referential variables, both eventive and nominal, enriching the LF). I have thus dispensed with an operation that required stipulative notions for its implementation, and have a simple, free, unbounded generative system instead, which I take to be a desirable result. To summarize, I eliminate subindexes from the *Array* and implement a *type-token* relation in a Free-Merge system. By this means, I do not restrict stipulatively or *a priori* how many *tokens* will Merge in structural positions that lead to optimally relevant interpretations in both interfaces. Movement is therefore redefined in terms of *externally merging a token of a type in the Array in a position, licensed by a procedural element, and in which there is an increase in the informational load*, following DFI. The derivational dynamics I argue in favor of is as follows (Krivochen, 2012: 7)

> "**Definition 15:** *Select* instantiates a *type* in a W_X following **Principle 2** [the Conservation Principle].

Definition 16: *Merge* concatenates LI-tokens in a W_X driven by the interfaces' constraint expressed in **Definition 13**. [a *token* is never fully interpretable at the relevant Interface Level IL unless within a larger structure.]

Definition 17: *Analyze* evaluates the objects built via *Merge* in W_X in order to verify full interpretability in IL_X.

Definition 18: *Transfer* is the operation via which an Interface Level IL_X takes a fully interpretable object from W to proceed with further computations.

Corollary: if W_X interfaces with more than one IL, *Transfer* applies for each IL *separately*.

Definition 19: *Merge, Analyze* and *Transfer* are both interface-driven and interface required.

Definition 20: 15, 16, 17 and 18, occurring cyclically, determine the derivational dynamics in W_X."

Array is not a primitive concept, or anything like a *representation level*: it is never interpreted, and no conditions on well-formedness apply to it. In this sense, my proposal greatly differs from Martin & Uriagereka's (2011) hypothesis involving *types* and *tokens*. They claim:

> "*There is no natural way of capturing tokens, other than by refying lexical arrays into numerations, objects that exist pretty much in the technical sense of a level of representation*"

The reader must have noticed that I have captured the type-token relation in both a formal sense and at the semantic interface, and also accounted for *selection* via Conservation Principle, without resorting to any new assumption, at least within the present framework. Numerations, strictly defined, require numerical subindexes, which are actually *diacritics*, whose interface justification is hard to find. Actually, once one has a natural way to capture

types, *tokens* follow naturally without stipulations in a Free-Merge framework, interface-driven.

2.1 Reconstruction procedures at the Interface Levels and the *type-token* relation

An account of Displacement should address the question of how the interpretative component (i.e., C-I, the inferential module in Relevance Theory) puts together the information that has been provided to it by multiple Transfer? There must be, apparently, some connection between phases, and that connection would be the role of "phase edges" (Boeckx, 2010; Gallego, 2010). However, that only makes sense if one posits that phases are *endocentric* and that labels exist in the syntax. If I do not distinguish between X' and XP, there is no point in talking about edges (i.e., Specs.), at least in the traditional sense. Phase edges are said to have relevance to reconstruction processes, that is, the system can trace back the derivational path of a certain element by looking at its previous positions in the periphery of the phases it had to move through to get to its final destination. In my model, however, things are analyzed differently. To begin with, our phases are not endocentric, but defined in terms of *convergence*, as the ***minimal term*** *in a certain level fully interpretable by the next component* (Krivochen, 2010b). If I combine this with a radically "bare phrase structure" (Krivochen, 2011b), what results is a picture in which there is neither real "phrase structure" (X-bar theory) nor "phase structure" (Boeckx, 2008), but only *structure*. That is, *there are no phrases in the syntax, there is no projection or labeling either, only free applications of Merge and Transfer of fully interpretable units*. The role of edges, and the existence of edges themselves only makes sense if there is something that is *not an edge*, and that is simply absurd in our framework. Of course there are reconstruction effects at the interface levels, ,

and, in fact, dependencies across phases are *only relevant in the interface levels*, since those dependencies are interpretative, and syntax is a "blind" generative component. Let us put this straight:

(9) If α and β are interface-associated via their coordinates in W, there exists a *Dependency* between α and β.

(10) *Dependencies* are read off in IL, not in W.

(11) A *dependency* is *Local* if and only if there is no intervenient object γ (of arbitrary complexity) such that: (i) the relation between α and γ is equivalent to that between α and β for interface purposes (ii) α, β and γ belong to the same W and (iii) γ is structurally closer to α than β

Therefore, the only requirement for reconstruction to take place is to give the interpretative component some clue that what generativists used to call a *chain* CH = $(X_i \ldots h_i)$ must actually be expressed in terms of *tokens*. Movement and copy erasing is expressible in terms of *multiple occurrences tokens of the same type* of an element in a *type-array*, motivated by "drastic interface effects", that is, effects in the *explicature*. This way a principled explanation for the Spell-Out of *only one* of the tokens, in standard cases, can be proposed: if an element is displaced, the index (in traditional binding terms) should be maintained across the derivational path, and the simplest way to do this is by materializing only the copy whose structural position leads the system to optimal relevance. For example (assuming Grohmann's 2003, 2004 analysis):

(12)

a) John wants ~~John~~ to leave. *Optimally relevant, LF sees both occurrences of [John] as different tokens of the same type, i.e., they are "coindexed" for explicature purposes.*

b) John wants John to leave. *Only optimally relevant if disjunct reference is understood. The Spell-Out of both [John] is interpreted as two different types, and the coindexation cannot take place.*

If an element is Spelled-Out, that is apparently more costly than leaving it as a null copy (not in terms of computation, but in more concrete terms of "linguistic machinery"). The generalization would be "if you can leave something covert, do so. If you make it overt, then you must have a powerful reason for that (e.g., you want to generate some positive cognitive effect that could not have been generated with the covert option)", that reason being very much in the spirit of Grohmann's (2003, 2004) *Condition on Domain Exclusivity* "drastic effect on the output". However, even if *both* instances are Spelled-Out, the interpretative system looks for an interpretation, since there is a presumption of optimal relevance that makes the system analyze all the possible interpretations serially until relevance expectations are fulfilled. Copy-erasing would be a clue, like many others (e.g., procedural categories), that leads the inferential system to the intended interpretation.

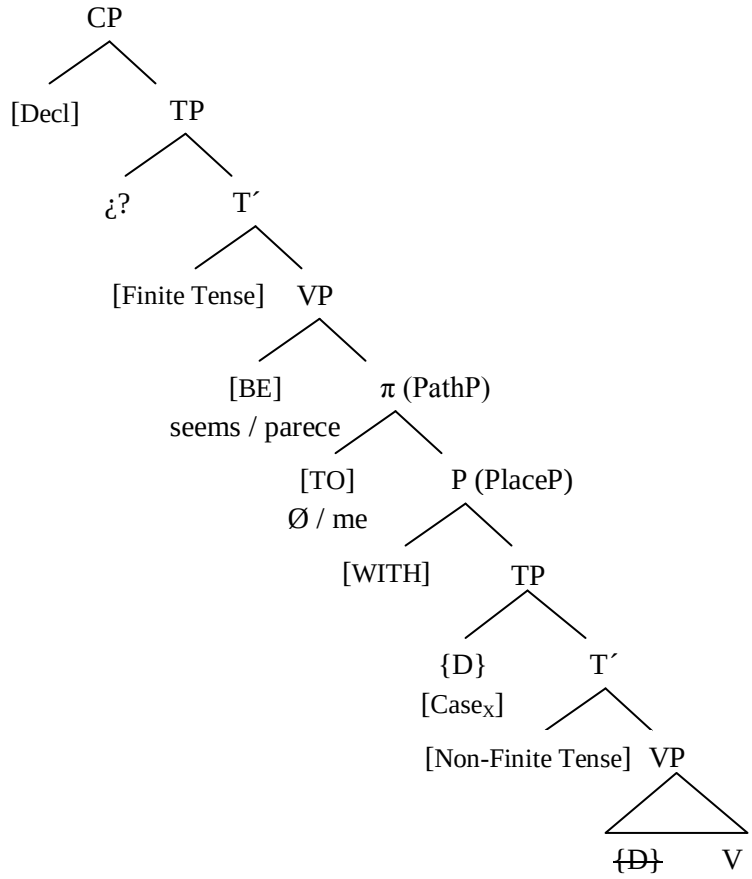
2.2 The analysis put to test

2.2.1 Raising-to-subject movement

I will address now a problem that has been analyzed from very different perspectives: raising-to-subject movement. I will focus on, but not only refer to, instances of "seem"-type verbs,

but, in a more general spirit, the movement of any constituent to Spec-TP. The solution to the problem may have to do with the concept of *theme* (informationally understood, as opposed to *rheme*), and the requirements of the semantic component. Let us consider a typical "seem-raising structure" with a *split spatial domain* (Acedo-Matellán & Mateu, 2010, Krivochen, 2011a):

(13)



What has to be done now is check whether the conditions for Case interpretation of the DP at the semantic interface obtain. Let us proceed bottom-up. After the complete assembling of the thematic domain (*v*P / VP), a T node merges. This T, being non-finite, cannot license a NOM

Case interpretation in the relevant argument. If V tried to license ACC / OBJ in that {D} the derivation would crash in the explicature level since (as raising Vs are unaccusative) there is no [cause] primitive that conveys affectedness and can generate a *theme* interpretation, so an appropriate "probe" for NOM licensing must be found. All the nodes that are merged until matrix T are unable to license NOM, so they are not intervenient in terms of Minimality. If the only requirement to license NOM is *absolute*[4] T, which would be the optimal scenario (and the one I will assume), then matrix T is the only appropriate "probe". As there are no intervenient heads between T and {D}, T can generate a Case interpretation for the {D} construction. So how and why is Spec-TP filled? The answer seems to have to do, as I said above, with the concept of *theme*. One proposal could be the following: [EPP] can be dispensed with if the thesis that Spec-TP is an *informationally relevant* position, in terms of the construction of the explicature, is entertained. Of course I am not trying to do discourse analysis here, but it is known that the dynamic *old information-new information* is important for determining the relevance of a proposition[5]. If it only provides old information, it will not be relevant. If it provides only new information, then the Inferential Component (in Relevance Theoretic terms), which I identify with C-I, will not be able to select an appropriate context to process it, and optimal relevance will not be achieved. Elements that move to (i.e., are *remerged in*) Spec-TP are *themes*, and when there are mere presentational

[4] Needless to say, it would be false to claim that all non-finite forms convey relative tense, as the morphological expressions do not correspond to semantic interpretation. Arguably, then, Latin historical infinitives convey absolute tense in specific environments, in local relations with other procedural nodes.

[5] For example, Sperber & Wilson (1986a) establish that, *ceteris paribus*, if a proposition provides only old information, it will not be relevant, as no positive cognitive effects will be obtained. If the proposition conveys totally new information, there will be no context to compute it in. One way or another, *optimal relevance* is not achieved.

sentences, which introduce new referents to the discourse, an *expletive* (either overt or covert) is required:

(14) There is a book on the table
(15) Hay un libro sobre la mesa
Is$_{3SgExistential}$ *a book on the table*
'There is a book on the table'

[a book] is not an element that can be independently manipulated by C-I, that is, it is *not a phase* in Krivochen's (2010b) terms. Indefinite elements cannot rise because they *cannot be theme*, as they are newly introduced participants (or are presented as such). Of course, it is not the case that (in-) definiteness is an inherent property of certain morphological realizations of the functional category D, but it is an interface-reading of the cumulative influence nodes like T, Asp and Mod have over an argument (i.e., {D…α…√}). Sentences like (14) and (15) are called *thetic sentences*, as they lack *theme*. Spec-TP seems to be a position reserved to elements whose features of definiteness have already been licensed (in the way described in Krivochen, 2010a) and that are thus able to function as *theme*. Violations of these descriptive generalizations rarely generate ungrammaticality (since no principles of the grammar –if there are such things in the first place- are violated), but semantic anomaly at the *explicature* level, *in the interface*. See, for example, (16):

(16) ?! There seems John to be in the room (irrelevantly, [There seems to be John in the room] is equally anomalous)

[John], as a proper noun, is by definition *thematic*, and thus its raising is "obligatory" for the explicature to be built in order to satisfy relevance expectations. But bear in mind that Case can be interpreted *without raising* (even in feature matching frameworks), and therefore, it

would be wrong to regard (16) as "ungrammatical" because of case reasons, which is what the generativist orthodoxy would say. Movement to the external position licensed by T is, then, triggered by interface conditions, namely, C-I conditions on the construction of the *explicature*.

How would this work in a *Radically Bare Phrase Structure* (RBPS) scenario? No major changes have to be done, but a note is necessary. Bear in mind that the structure above is simplified, since TP is not *Split*, as it should be. Consider a RBPS with separate T, Asp(ect) and Mod(ality) nodes. If token merge in a position licensed by T is motivated by *themehood* (a claim that is too strong and general to be true, but empirical evidence seems to support it at least to some extent), I can very well assume that movement to merge with each of the nodes is motivated by a different semantic reason. Let us take [Mod], for example. Taking into account that the outlined model is strongly componential, there is no way of determining *a priori* what the motivation may be in a given case: the specific derivation in hand must be examined. But, for the sake of expository simplification I can say that, depending on whether the clause under consideration is a simple matrix clause or a subordinate clause, the "subject" of the sentence (in traditional terms) can be the modal subject, that is, the person that makes the modal judgment in either epistemic or deontic terms; or the modal object, that is, the object of the modal judgment by the subject of the main clause. Ultimately, it all reduces to a question of *scope* in LF, as the reader may have imagined. Needless to say, an element "retains" the semantic properties of the intermediate places it has "moved to" (*been token merged in*) in the course of the derivation, so that a {D} structure can be read off at the semantic interface as at the same time a modal subject and the theme of a clause, if there are

occurrences of that element in the external positions of Mod and T respectively. We have, then, an elegant account of movement, without resorting to anything but interface conditions and *explicature* possibilities in the search for *optimal relevance*.

2.2.2 Wh- interrogatives and the structure of the Left Periphery:

In this section I will try to account for instances of Wh-movement, and revise the structure of the so-called "Left Periphery" (Rizzi, 1997). Within GB, from Chomsky (1986) on, movement to positions higher than TP is thought to be A'-movement to CP, the projection of the functional category Complementizer. Whereas early Minimalist syntax justified this displacement by means of p(eripheral)-features, uninterpretable [Wh-] or equivalent that are Checked and Deleted in a Spec-Head relation, so that Movement was an essential part of Feature Checking; later Minimalism, with Matching Theory, allowed features to be valued in a distant (but local) probe-goal relation and thus Movement was triggered by a different kind of feature: EPP (or, more recently, EF) in C. Of course, all this is incompatible with Radical Minimalism as it presupposes substantive complications for the theory. We will analyze the characteristics of Wh-movement and try to derive displacement from interface conditions, in order to make it *principled*.

Recall that in Radical Minimalism there are no purely syntactic triggers for operations (i.e., no so-called "formal features" to check), since their application is ruled by a single interface requirement, namely, DFI (which we repeat here for the reader's comfort):

(17) ***Dynamic (Full) Interpretation***: *any derivational step is justified only insofar as it increases the information and/or it generates an interpretable object.*

Given the fact that we have eliminated the feature checking / valuation procedure from the architecture of the cognitive system because of its essentially stipulative character, our only choice is to find an interface motivation for displacement (i.e., *token-Merge*) in different structural positions. To begin with, let us state the following premises that will lead our inquiry on Wh- Movement:

- *Token-Merge occurs only if there is a procedural node that requires so* (restrictive statement)
- *No two targets for token Merge can generate the same interface effect* (anti-redundancy statement)
- *The interface effect is a function of the local relation between a conceptual and a procedural node* (componentiality statement)
- *Extraction filters must be reformulated as interface requirements over dependency establishment. If this is not possible, the relevant filter must be eliminated and their effects, accounted for via independent interface requirements* (anti-stipulation statement)

There are two questions must be asked when considering (Wh-) movement within Radical Minimalism: *Why?* and *Where?*. Whereas previous approaches to the issue have taken into account only *syntax*, I will start from "earlier steps", namely, the *intention* of the speaker and the complex semantic object shaped according to that intention. Bear in mind that I have posited a pre-syntactic instance of C-I, and that is where I will depart from. Wh-elements move because of a *semantic* reason, not because of a *syntactic* reason, given the fact that

syntax is free[6]. Therefore, I must find a semantic motivation for Wh-movement, and then analyze what the landing site(s) is / are. Let us take a look at the following examples:

(18) What did you buy?
(19) ¿Qué compraste?
What buy$_{3SgPastPerf}$
'What did you buy?'
(20) Who came?
(21) ¿Quién vino?
Who come$_{3SgPastPerf}$
'Who came?'

Those are very simple examples in English and Spanish, but they will do. Both (18) and (19) can be paraphrased as "you bought something. I want to know exactly *what*", and (20) and (21) as "somebody came. I want to know exactly *who*". The first part of each paraphrase is what the sentence *presupposes*, given the following definition of *pragmatic presupposition:*

(22) *A presupposes B iff whenever A is true, B is true, and whenever A is false, B is true.* [in other words, B's truth is a *necessary* condition for A's having truth value][7]

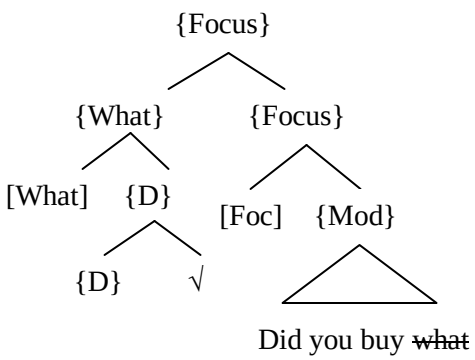
That is, Wh-interrogatives generate presuppositions in the semantic interface, as presuppositions are part of the explicature building process. We have claimed in Krivochen (2011a) that Spec-T is a position related to *themehood*, Top generates *entailments* (thus, there is a *contrastive value* in Top-like licensed positions) and Spec-Mod is reserved to the *modal*

[6] Bear in mind that we are not saying that syntax structures semantics (Cedric Boeckx, p.c.), but that (post-syntactic) semantic structures are a *function* (in the mathematical sense) of syntax, that is, they are read off the structure. Neglecting the possibility of pre-syntactic semantic guidelines is neglecting the "intentional" part of C-I. *Pre-syntactic semantics* (C-I_1) determines the limits of what the syntactic structure can convey (as structure is meaningful in itself) and *Post-syntactic semantics* (C-I_2, RT's inferential module) reads the resulting LF and builds an explicature. Otherwise, there would be no information to instantiate linguistically, *concepts* must come from a non-linguistic pre-syntactic module (as they are needed by other faculties).

[7] This definition is on the line of Strawson (1950).

subject, in modal logics' terms. No presuppositions involved here. We must therefore think of a higher node, semantically interpretable, that licenses an external position for the presupposed constituent, just as [cause] licenses an external position for the initiator. We will call that node *Focus*, maintaining Rizzi's terminology for clarification purposes. Movement to Foc is motivated because the functional-procedural node licenses a remerge of a *token* of the presupposed constituent. We will assume that Wh-elements are not D, but Wh- elements merged with a {D, √} structure. This is so because D generates an existence presupposition (following Strawson, 1950), and that presupposition is a *sine qua non* condition for the more global presupposition is generated. In other words, if nobody came because nobody exists, the presupposition generated by the Wh-interrogative could hardly exist as well[8]. The structure of Foc in a sentence like (18) would be as follows, using labels for clarity purposes:

(23)



The reader must have noticed that we have not posited T-to-C movement, as Pesetsky & Torrego (2000) –among others- do. The auxiliary [do] conveys [Tense] procedural instructions, thus occupying the "T head" in traditional terms, and the root √BUY receives a

[8] This problem has been analyzed by Russell, on the one hand, and Austin, Quine and Strawson, on the other, with the famous example of the bald King of France.

"verbal" interpretation at the semantic interface by virtue of being in a [T…α…√] configuration, as we have already seen. The external argument [you] is referentially definite (notice the perfective aspect in the V, which favors EQ interpretations and, in this case, also puts an upper limit to the implicature), therefore, a token is merged in the external position of T to be interpreted as *theme*. However, it need not be Spelled-Out there if the Spell-Out of a structurally lower token leads to plain convergence. This implies that the "*always Spell-Out the higher copy*" desideratum that underlies the Copy Theory of Movement (sometimes overtly, sometimes covertly) should be abandoned in favor of a freer system that, moreover, could increase descriptive adequacy (i.e., account for inter-linguistic differences regarding word order) without adding stipulations.

The same derivation can be posited even for *v*-to-T languages like Spanish, the Aux is just replaced by a full heavy verb. As no EPP is involved, no position *needs* to be filled stipulatively. The (labeled) structure would look like:

(24) $[_{Foc}\ [_{Qué}$ Qué] [Foc] $[_{Mod}\ [_{Mod}$ compraste] $[_{Asp}\ [_{Asp}$ ~~compraste~~] $[_{T}\ [_{T}$ ~~compraste~~] $[_{v}$ $[_{v}$ ~~compraste~~] $[_{V}\ [_{V}$ ~~comprar~~] $[_{\sim\!Qué}$ ~~[Qué] $[_{D}$ Ø~~]]]]]]]]

There is no external argument, as positing a *pro* null subject there would add nothing informationally to the processing, that is, it would not be legitimated by the interface since all the person-number information the corresponding interpretative interface can retrieve from the verbal ending (see Krivochen & Kosta, in press). The sentence is thus *thetic*.

Notice that I have put a *token* of the V in each of the nodes of Split TP so that it "absorbs" the procedural instructions of the nodes it is e(xternally)-merged on, but actually

there is no need to "move" it, I can just posit (as I have done elsewhere) that *morphological fusion* has occurred and T, Asp and Mod nodes have been Spelled Out by a single Vocabulary Item, [-ste]. Of course, the selection of the copy to be Spelled-Out is not principled, but depends on *Optimal Relevance* in a global level and *language-specific Spell-Out patterns*. This way, features and parameters that have proven problematic and *ad hoc* can be dispensed with.

I have provided an account for a traditionally called "discourse-driven" process like elicitation of information from a syntax-semantics interface point of view. Regarding intermediate landing sites, the question whether there is any could legitimally arise. As a matter of fact, *token-Merge* applies when [Foc] enters the derivation, crucially not before since there is no interface-driven trigger for the operation. Lower phases could perfectly be transferred as there is no uninterpretable symbol (here, *v* collapses [$Case_X$] in the internal argument), and Spell-Out of tokens is driven by *optimal relevance*. In this case, given the Spell-Out patterns of both English and Spanish (which escape the scope of syntactic study, as the B-List and phonological patterns in general depend on sociohistorical matters rather than sub-personal factors) the most relevant token to be materialized is the highest one. In principle, there is no constraint to the number of copies that can be Spelled-Out, but the explicature will either change or require too much effort to process, which can be seen in (25a) and (25b) respectively:

(25)

a) John hit Peter and John kicked Peter
b) What did you buy what?

The only possibility for (a) is interpret disjunct reference, otherwise, Optimal Relevance will not be achieved: entities are multiplied way beyond necessity, and thus cognitive cost overwhelms positive cognitive effects (i.e., inferences). Apparently, a PF generalization that can be made, building on Chomsky (1995) is that *the minimal number of copies of the smallest syntactic objects leading to convergence must be Spelled Out*, the position being determined by themehood, presupposition, and other semantic reasons. (b) is straightforwardly too costly to process, as there is no positive cognitive effect that justifies Spelling-Out both tokens of [what]. Movement and Spell-Out have thus been justified in *interface terms*. We will return to this below.

What about so-called adjunct-movement? Well, there is no difference with the scenario I have presented so far. One caveat is in order, however: *RM does not accept the distinction between "arguments" and "adjuncts"* since nothing is minimally required or dispensable in a syntactic derivation, specially taking into account that headedness is an interface epiphenomenon for us, and notions such as "complement" and "specifier" are relationally defined upon "head". We have predicators and arguments taken in a logical sense, and since the explicature is a complete propositional form, this seems to follow; but the traditional distinction, to us, lacks principled justification. We will take those elements that orthodox Generativism calls "adjuncts" to be generated in different procedural nodes, depending on the information they convey. So, for example, [deliberately] is an element that has to do with agentivity, therefore, I will consider that it generates within the {cause} domain. Likewise, an element such as [twice] conveys Aspectual (iterative) meaning; [never], both Aspectual (iterative) and Polar (negative) meaning. In the latter case, I could either posit

that the element in question has a token in both nodes, thus carrying their procedural information, or that there is *cumulative influence* of Asp and Pol(arity) over the Adv. There is no limit, *a priori*, to the number of nodes that can be involved. Whatever the case turns out to be, there is no difference with so-called "argument" movement. A controversial claim, which is a possibility under investigation now, is that "adjuncts" are actually "arguments" of procedural (non-relational) nodes, such as T, Asp and Mod, in the sense that they license their appearance and determine the procedural instructions that they will convey, whereas scope relations between procedural nodes determine how mismatches are solved in the semantic interface (Manuel Leonetti, p.c.).

3. Locality and successive cyclicity revisited:

The account of interface-driven displacement I have presented has some similarities with Grohmann's (2003, 2004) *intra-clausal movement*, it goes upwards to the *immediately "dominant" informational domain*, built and analyzed by the interface in real time. In our system, the notions of *locality* and *anti-locality*, of frequent appearance in recent works on syntactic theory, follow naturally from the way in which the dynamics of the (syntactic) derivation interact with interface conditions. What I would like to do is *justify* these concepts, go further than descriptions and explanations that have been given so far (Rizzi, 2004, Grohmann, 2003, Boeckx, 2010, to name just a few of the most important works). The relevant element would not need to stop in each available position, but only on those that, once the relevant head is merged, the informational load for the interfaces increases, as the derivation proceeds *in real time* and no object can "see" what will be merged later on. This is **why** there is ***locality***: although it can be argued that it would be simpler to wait until the

whole derivation is completed and just move the element to its final position, that option would imply maintaining a larger structure in the working memory, a scenario that is far from optimal from a biological point of view (and would wipe phases clean, incidentally). *Successive cyclic movement* is a way of minimizing computational cost. Movement applies as soon as it can (i.e., as soon as a new informational domain is created and there are therefore new heads that can enter in a *licensing* relation with the object in question), waiting would imply departing from the best option, which has to be justified independently. ***Anti-locality*** derives from the fact that each informational domain has the procedural features to make a certain dimension collapse, but not other, so *intra-domain* movement would be trivial, with no effect in the interface. Informational domains are both *homogeneous* and *heterogeneous* in nature, let us see why: they are *homogeneous* because they are defined taking into account the ***type*** of information they provide the interface with (e.g., T, and Asp give definition, reference to the generic event denoted by the *v*P domain), and this homogeneity can be seen in instances of *morphological fusion*, heads belonging to the same domain can be fused, as it happens in Spanish with T, Asp and Mod, spelled-out as a single affix (i.e., by means of a single VI). Their *heterogeneity* comes into play when considering these domains closer: they convey the same ***type*** of information, but not the same information by any means, or the *Split TP* would not have any sense (and I hope to have demonstrated otherwise in Krivochen, 2010a). Homogeneity has to do with "cumulative influence" over an object's quantum dimensions; heterogeneity has to do with the specific contribution a head makes to the explicature level.

It has to be taken into account that **optimally**, *at every point in the diachronic derivation*, interpretability should be satisfied (of course, a rigid interpretation of this claim

would lead to a crash-proof system like Frampton & Guttman, 2002, which I do not want. See Putnam, 2010 for an alternative view on crash-proof syntax). That is, if a determined point in the derivation is described as a structural configuration Σ in which a syntactic object SO does not receive an interface interpretation or the informational load could be increased by creating a new object Σ' in which SO establishes a relation with a certain procedural node, this SO *must* "move" immediately, which we will understand in the sense of *monotonically merging a token of the minimal structure containing the relevant element* (optimally, *only* the relevant element), in consonance with the *extension condition*. In a more general spirit, let me say that there is only one "constraint" to the application of syntactic operations, which I will call *Dynamic (Full) Interpretation*[9]:

(26) ***Dynamic (Full) Interpretation***: *any derivational step is justified only insofar as it increases the information and/or it generates an interpretable object.*

The reader must take into account that this does not mean that I am changing a strong derivational model for a representational one, since DFI must be satisfied *in real time*, after every application of Merge, as I have said. I strongly stress the *diachronic nature* of Merge.

In a representational model (GB, for example); conditions on good formation were applied to fully-fledged representations, namely, D-Structure, S-Structure, LF and PF. My proposal regarding syntax is that it is *free*, conditions upon it are interface-driven and there is nothing more to it. A note of some importance should be made here: I have already argued against *Phase Edges* in previous works (Krivochen, 2010b, 2011b), and here I will provide

[9] I will make use of DFI to analyze the topic of *edges*, but it is very useful to gain insight into other areas as well. For example, the analysis of Merge in Adger (2011) can be revisited under this light, as well as the derivation of roots in De Belder & Van Craenenbroeck (2011).

some more evidence in favor of this proposal. If the claim that an operation is only legitimate if it follows from DFI (that is, interface requirements) in accepted, then a question arises: what (if any) is the difference in legibility between (a) and (b)?

(27)

a) $[_{v\text{P}}$ YP $[_{v'}$ $[v]$ $[_{\text{VP}}$ $[_{\text{V}'}$ [V] $\text{XP}_{[\text{u-F}]}]]]]$

b) $[_{v\text{P}}$ $\text{XP}_{[\text{u-F}]}$ $[_{v'}$ YP $[_{v'}$ $[v]$ $[_{\text{VP}}$ $[_{\text{V}'}$ [V] ~~$\text{XP}_{[\text{u-F}]}$~~$]]]]]$

Let us assume that the "uninterpretable feature" in XP cannot be valued by *v*, but by some other higher head, say, T, or C. Does movement to outer-Spec-*v*P value and erase the feature in question? Certainly not. Therefore, there is an operation that applies to Σ, a non-fully interpretable unit, and generates Σ', an object which is equally uninterpretable by the interface levels. A superfluous operation, put differently. Not only does this take us away from strict *last resort* conception of movement (since the derivation is by no means "saved"), but it also complicates the system both descriptively and explanatorily. Such a theoretical apparatus needs stipulations that I will try to eliminate. My objection, however, is only valid if one accepts *Dynamic Full Interpretation* Principle, which I think of as an important economy principle in a strong derivational approach: I keep syntax blind and free, and attempt to provide a justification for legitimate operations in interface-legibility terms only. Let us see what a derivation would look like in Radically Minimalist terms, starting with the SO depicted in (a) (I will use labels just for expository purposes, but beg the reader to think of these representations as bare structures):

(28) $[_{v\text{P}}$ YP $[_{v'}$ $[v]$ $[_{\text{VP}}$ $[_{\text{V}'}$ [V] $\text{XP}_{[\text{Dx}]}]]]]$

Once this stage in the derivation is reached, there is an element that, if transferred, would cause the derivation to crash as it bears a dimension [D] in its ψ-state. As I have said before, local relation with *v* cannot generate an unambiguous interface reading, suppose it is a feature related with definiteness. In Krivochen (2010a) I -hope to have- demonstrated that definiteness in DPs depended on a local relation with three nodes, Asp, T and Mod, each of which provided the inferential module with different clues for interpretation. So, I will assume this scenario as an example. The next step would be the merger of another element, following *monotonic Merge*. The *v*P domain denotes a *generic* event, so the next relevant head would have to be one that can contribute to the specification of this reference. In Krivochen (2010a) I argued in favor of considering that T is this node. In other words, a set of procedural dimensions extending the structure and increasing the informational load (dimensions that could, but do not need to, be later Spelled-Out) merges following DFI. Let us call this set a T node, for simplification purposes. As the structure is not interpreted by the interface system as a generic event anymore, but as an event situated in a specific time frame (of the form $<e_x, t_y>$ in a traditional Cartesian representation), T has scope over *v*P, and a "label" is recognized by C-I. Remember that labels do not exist in the syntactic Generator since they are irrelevant to it, they are "recognized" (*not* created, so as not to violate the *inclusiveness condition* in traditional terms, or just because they are not necessary in the syntax, in a more contemporary spirit) in the interface level. The same happens with [Asp], a node that conveys the way in which the speaker sees the previously defined event: as a point or as a developing event, with internal structure. The {Asp} "projection" (AspP, in traditional terms) closes the proposition, since the next node, [Mod], conveys a subjective evaluation over the propositional content (in epistemic or deontic terms), in order to do which this node

must not only be outside the proposition but have scope over it. In this structure (in which I have omitted the spatial projection in order not to complicate things, let us just assume it is an unergative verb in a transitive alternation) there are two *informational domains* (for the time being), namely, [Mod [Asp [T]]] and [cause [event]]. Informational domains can be indentified because their nodes can be *fused* in Vocabulary Insertion, as I have already said. By *fusion* I mean that a single VI can Spell-Out dimensions in more than one head, that is, there is no one-to-one correspondence between nodes and VI but, if a given language allows it, a single piece can materialize several nodes. This, of course, is a purely *extralinguistic* and *sociohistoric* matter, as all lexical matters are. All I can do is explain what happens *up to* Vocabulary Insertion, but the historical nature of the lexicon (why some words, even though possible, are not coined, for example) is beyond our scope (as formal linguists concerned with the functioning of the mind-brain).

The present proposal has direct consequences for the theory of *escape hatches*: in our model, such a notion is simply *unformulable*. Escape hatches (outer-Specs in phase heads) are superfluous positions, which, as I have pointed out, are not justified in interface terms. Besides, the bare structure I have posited in Krivochen (2011b) renders edges unnecessary, as the notion of a Spec position out of a phase domain is only formulable when there are, in the first place, *endocentric phases*, against which I have already argued; and in the second place, projections in the syntax (i.e., X-bar trees). If there are no phase heads, a direct consequence of defining phases exclusively in terms of minimal convergent units, the notions of *domain* and *edge* lose their theoretical weight. Besides, the mere term *specifier* makes sense when there is a projection system in the narrow syntax, which is actually no more than a labeling

algorithm (XP, X', X_0). If syntax can do without *labels*, that is, if labels are *interface-identified* in the explicature level, then the whole phase system has to be revisited critically. Another consequence of our proposals is that the very notion of *successive cyclicity* must be revisited, as the "intermediate landing sites" must be legitimized by interface requirements, that is, there cannot be an element remerged in a position in which it is superfluous (for details, see Krivochen & Kosta, in press). In this sense, my proposal is very much in the line of Grohmann (2003), but I tend to a much simpler form of Minimalism. Architecturally, the resultant model is surprisingly simple, but, as the reader must already have thought, there is still a long way to go before full operationalization.

4. Informational Domains and Prolific Domains:

It is time to devote a section to the analysis of what I have called "***Informational Domains***" (ID), and compare them with K. Grohmann's (2003, 2004) ***Prolific Domains*** (PD), to see in which ways they are similar and in which ways the operationalization of the ideas differ substantially.

First, let us define what Grohmann means by "Prolific Domains" (Grohmann, 2004: 212):

"*A Prolific Domain is a contextually defined part of the computational system, which provides the interfaces with the information relevant to the context and which consists of internal structure, interacting with derivational options".*

CP, TP and VP are thus "prolific" in the sense that they contain more than one "layer":

VP is expanded in *v*P and VP since Larson (1988) (see also Hale & Keyser, 1993).

TP is expanded in Agr_SP-TP-Agr_OP in Pollock (1989) and Chomsky (1995).

CP is expanded in ForceP, TopP, FocP and FinP since Rizzi (1997).

Within *v*P and its associated projections *thematic relations* are established, so this PD will be called *Θ-domain*.

Within TP and its associated projections, *agreement features* are checked (an operation that relies very much on phi-features), so this PD will be called *Φ-domain*.

Within CP and its associated projections, lastly, *discourse-driven* operations are performed. This domain will be called *Ω-domain*.

The revised structure, an expanded version of the classic Chomsky (1986) clause structure is as follows:

(29) $[_{\Omega\Delta}$ ForceP…TopP…FocP…FinP $[_{\Phi\Delta}$ Agr_SP…TP/IP…Agr_OP… $[_{\Theta\Delta}$ *v*P…VP]]]

I have criticized some aspects of this clause structure in Krivochen (2010b), now I am concerned with the *nature* of PD rather than with their inner structure. Grohmann defines them as providing interfaces with information, each domain of a different kind. The informational value of the Ω and Θ domains is clear, and I cannot add much to what Grohmann has said about it. However, the contribution of the Φ domain either to the explicature or to phonology is another matter. Within the Φ-domain, agreement properties are licensed, but I have said that a system with Agree is a stipulatively constrained system, that departs from our idea of a radically simple syntax. Even replacing the notion of "agreement" with pure "licensing" under the scope of a functional-procedural node, the composition of this

domain is conflictive from an interface point of view: are AgrS and AgrO fully interpretable? Why would they be needed, in the first place? I have suggested that Case can be accounted for with a system containing only *v*, P and T, any other nodes are superfluous. And, as such, they must be eliminated.

Apart from these technical issues, which can be solved easily even within a PD framework, there are some other aspects to consider. I will analyze specially two: the *type of information* handed to the interfaces and the *transfer point* ("timing", so to speak).

a) **Type of information**:

Whereas PD handle information about *thematic relations*, *agreement features* and *discourse-driven processes*, I believe that the *theoretical status* of the Φ-domain must be analyzed deeper. Actually, there are no restrictions whatsoever regarding conditions nodes must fulfill to form each PD; as a consequence, Grohmann's clauses include Agr_S and Agr_O, both of which were eliminated in Chomsky (1995) for being superfluous projections for FIP purposes. We posit that if a domain is to be interpreted by the interface systems, then all the projections contained within that domain must be fully interpretable (thinking in traditional X-bar terms). PD seem to be defined in quite aprioristic terms, in spite of the definition Grohmann gives, which appears to be dynamic…and it really is, if it were not for the fact that projections are arranged in advance. The diachronical aspect of the syntactic derivation is therefore lost, and the definition loses much of its explanatory potential.

There is yet another problem, and it is the *interpretability of the Φ-domain*. It is not clear that "agreement" is interface relevant, especially if interpretative systems can rely on

structural configuration for establishing relations between procedural heads and root-based structures (i.e., lexical items). It is essential to bear in mind that in no point does Grohmann speak about Tense / Time features, but the Φ-domain is the locus of Agr. As I have done away with *Agree* as it is conceived of in traditional Minimalism, a Φ-domain formulated in Grohmann's terms is neither necessary in or compatible with our proposal.

My *informational domains* operate in quite a different way. There is a single combinatory operation that concatenates elements (say, roots and functional-procedural nodes) following interface requirements. I will also work with three domains, not structurally but purely interface-defined. In other words, there is no place for *a priori* boundaries in our system, consequently, *concatenation* builds a structure and then the interface levels *recognize* domain boundaries *on-line* as fully interpretable material is transferred. Interestingly enough, domains in LF need not coincide with domains in PF: domains in LF are defined taking into account the information they provide for an explicature to be built. In PF terms, if certain nodes can be *fused* into a single VI, they are recognized as a domain (see Krivochen, 2011b):

i) {D, {P, D}}: LF: locative information

PF: no fusion is possible, as the P domain is the one in the bottom, there is no node to fuse with when the P head enters the derivation.

ii) {cause, {event, {P}}: LF: event including a spatial relation

PF: V and *v* are fused[10]. P can conflate onto V if and only if there is no lexical insertion, but I would not be talking about *fusion* but *conflation.*

iii) {Mod, {Asp, {T, {cause}}}}: LF: in strict dominance order, there is a modalized proposition, which includes an event delimited in time and seen either as a point or as developing.

PF: especially noticeable in synthetic languages like Spanish, in which Mod, Asp and T information is Spelled-Out by a single vocabulary item.

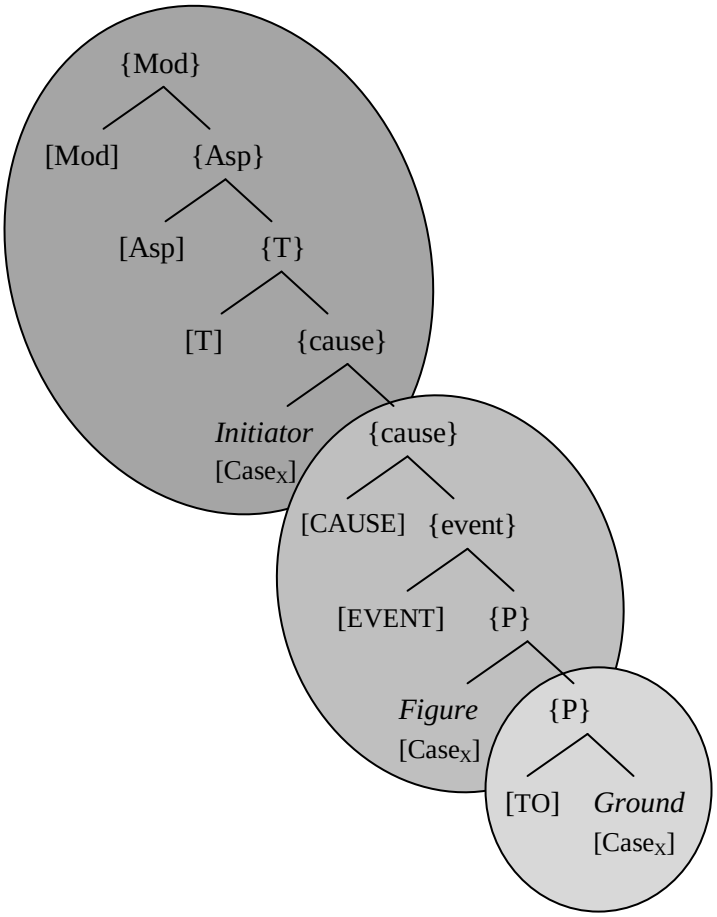
A note has to be made here: the fact that in a given language (English, for example) fusion is not possible is a mere historical accident, product of the lack of a single vocabulary item specified enough to spell-out those nodes. This does not mean that the fusion is not *conceptually possible*. Our claim is that the fact that a group of nodes convey the same *type* of information makes the fused spell out possible. We are consciously giving pre-eminence to LF (C-I) over PF (A-P), as there could not be human language without a conceptual interface, but phonology is not only accidental (i.e., not essential, neither necessary nor sufficient) but also *dispensable*, if *communication is an* ***epiphenomenon***. In spite of what some linguists try to put forth, there is no conceptual problem (and less so in a Radically Minimalist framework) in imagining a natural language *without phonology* at all: Merge would only be constrained by C-I requirements. It is very important to bear in mind that, if the *great leap forward* is the emergence of *conceptual addresses* (or *roots*, in our terms), C-I is not dispensable if language

[10] This shows clearly in languages where agentivity is presented as a *morpheme* in the V.

is thought of as related in a more general spirit with the infinite use of finite media -echoing Humboldt's words- since C-I *provides the media*, as opposed to the conception of language as a communication-oriented external phenomenon (e-language, in Chomsky's terms).

To summarize, let us remind the fully fledged clause skeleton I proposed in previous works:

(30)



Labels are included just for the sake of clarity, but I refer the reader to the above discussion and Krivochen (2010b, 2011b) regarding the status of labels. Instead of a labeled tree, the most neurologically accurate representation would be a bare *n*-dimensional (according to recent neurological research, 3-D, but higher dimensions are conceivable even though non

existent in the phenomenological world: with some effort, anyone can think of a *hypercube*) hierarchical structure, since labels (if interpreted as instructions to take a phrase marker as a unit for further computation) are of no use to syntax: syntax is a free unbounded purely generative mechanism that combines elements with the same format (Boeckx, 2010, Krivochen, 2011b). A Radically Minimalist theory should do its best to dispense with the *copy* operation that is required for labels to appear (and have relevance) in the syntax. Let us suppose that the following object has been created via Merge: {H, XP}, and is now to be labeled. Chomsky's labeling "algorithm" (it is rather a rule) predicts that H will project. For that to occur, H's categorial features must be copied upwards (an operation that was called "percolation" in earlier models), so that the information is maintained or rather increased: otherwise, there would be no point in labeling at all. Of course, that system presupposes that elements enter the derivation already categorized, a position I have argued against before. If there is no procedural category to collapse the categorial quantum dimension in H, there is no possible labeling, and there is nothing dominating H in the configuration I have analyzed. We put forth that "labels" are *recognized* rather that *created* in the LF interface level, as they are of essential importance for the construction of an explicature. The *inferential module* recognizes informational domains, delimiting them in the most accessible LF for the construction of an explicature.

b) **Transfer point**:

Even though Grohmann explicitly states that a PD framework does not necessarily entail Multiple Spell-Out, I will assume the MSO variant of the PD theory, as it will be useful to compare it with our own version of *derivation by phase*.

Let us first compare the Spell-Out timing of Chomsky's *phase theory* according to the two versions of the Phase Impenetrability Condition (1998; 1999, 2001, 2005):

- PIC_1 (MI): In the phase α, with a head H, H's domain is not accessible to operations *outside α,* only H and its Edge.

- PIC_2 (DbP, BEA, OP): In the phase α, with a head H, The domain of H is not accessible to operations ***at ZP*** [the next strong phase head], but only H and its edge.

Let us assume the following derivation, where H and Z are strong phase heads (say, *v* and C):

(31) [ZP… [XP… [HP [H YP]]]]

Under PIC_1, the transfer of YP occurs when H is merged, as it is explicitly said that no probe outside HP can have access to it, not even XP, which is not a strong phase head (in the terms of Chomsky, 1999). Under PIC_2, however, XP can have access to YP, which means that it is not transferred until Z is merged. Of course, if phases are considered to be the locus of feature checking and transfer, H's condition of strong phase head renders superfluous, as it does not trigger transfer. The "reduction of the computational burden" argument is significantly weakened, as the derivation is transferred when it is completed. The scenario is complicated even more if the relevant object is, for example, a CP appearing as a complement of a transitive V. By considering PIC_2, it is conceptually possible that V can have access to C and its whole domain. The only way to prevent this from happening is to stipulate, for example, that CPs always trigger transfer, which is of course untenable within Radical Minimalism.

We will turn now to PD and transfer point. According to Grohmann (2004), "Spell-Out applies *at* each Prolific Domain –as soon as a Prolific Domain is formed it spells out." There are no edges here, therefore, if the following configuration is assumed:

(32) $[_{vP}$ ZP *v* $[_{VP}$ V XP]

There can be seen a complete Θ-domain, within which thematic relations are "created" (using Grohmann's terminology, with which I do not agree since relations are *recognized* at the interface, not *created*: this would be a violation of inclusiveness constraints). As soon as *v*P is closed, it spells out *entirely*. This means that there are no edges left behind as in a Chomskyan model. However "natural" this Spell-Out system may seem, it is not stipulation-free. Even though PD provide the interfaces different types of information, and it would seem optimal that each PD be transferred as soon as it is complete, I will try to show that a dynamic definition of a MSO system is "more minimalist". The bigger the structure, the more it is divided (Boeckx, 2010). Having a static system means that there is no relation between the complexity of the structure and its chunking, an option I consider far from optimal, as it does not reflect (describe) or explain the mental mechanisms put in practice. It assumes an automatic mind-brain, which chunks information according to some pre-existing stipulative algorithm.

RM's version of MSO is a dynamic, system-neutral and non-stipulative one. Let us give the definition and then analyze the consequences of adopting such a framework:

(33) *P is a* ***phase in*** $\boldsymbol{M_X}$ *iff it is the* ***minimal term fully interpretable in*** $\boldsymbol{M_{X+1}}$

I will maintain Chomsky's (2005, 2007) claim that the *phase* is the locus of *transfer*. Not of feature checking, of course, since I have dispensed both with features as they were conceived in traditional Minimalism and checking operations. Besides, as our definition applies to any symbolic representation in the mind-brain, it would be unnecessarily restrictive to mention specifically linguistic elements in the definition: *transfer* applies from one module M_X to another when in M_1 a fully interpretable object for M_2 is assembled. Within FL, however, even though conceptually our definition is dynamic, against Grohmann's *static* conception, the empirical results are surprisingly similar in *most* cases. However, there are a number of differences that have to be taken into account. In my opinion, the three domains are defined as *collapse areas*, providing *locative*, *eventive* (either agentive or not) or *temporal-aspectual-modal* information to the semantic interface. Even though the inclusion of Mod within the same domain as T and Asp may be objected to as Mod is rather related with so-called *discourse-driven* processes (and, thus, with the Ω-domain), I argue that those apparent processes are really post-syntactic, related with the concepts of *explicature* and *implicature*. Rizzi's movements to the Left Periphery nodes TopP and FocP in order to represent shared and new information, to put an example, cannot be feature-motivated in our framework. Let us put aside the question whether those movements take place in the syntax proper or not. If these last-resort operations have an effect on the interface such as the generation of an implicature is something irrelevant for the study of syntax alone, but essential to the study of the syntax-semantics interface, as inferential contents like entailments and presuppositions are syntactically determined. Mod is a node that participates actively (and sometimes independently of Asp and T) in the definition of the reference of nominal constructions as I

have shown in Krivochen (2010a), and therefore, makes an essential contribution to the explicature in terms of referent assignment.

In Grohmann's model, *movement* is restricted in two ways: *locality* and *antilocality*. **Locality** establishes that an element must move cyclically, either inter- or intra-clausally, following these rules:

(34) *Intra-Clausal Movement Generalization*

$[_{\beta\Delta}$ XP … $[_{\alpha\Delta}$ … ~~XP~~ …]], where β >> α

Intra-clausal movement takes place between immediately dominating domains within a clause. Cyclicity means thus an intermediate landing point in each PD.

(35) *Inter-Clausal Movement Generalization*

$[_{\alpha\Delta}$ XP … ‡ … $[_{\alpha\Delta}$ … ~~XP~~ …]], where ‡ = clause boundary

Inter-clausal movement takes place between identical domains in different clauses. Cyclicity means thus landing sites in positions in identical PDs across clause boundaries, i.e., once a Ω-domain is complete.

Anti-locality establishes a restriction with respect to the occurrences of a SO within a PD, expressed in the *Condition on Domain Exclusivity* (Grohmann, 2003:107):

> *"For a given Prolific Domain ΠΔ, an object O in the phrase-marker must receive an exclusive interpretation at the interfaces, unless duplicity of O yields a drastic effect on the output of that ΠΔ."*

This means that there can only be a single occurrence of a given object within a PD (either the highest or the lowest, there is no restriction to it), unless Copy-Spell Out rule applies afterwards thus yielding the aforementioned "drastic effect on the output" (in PF terms). Therefore, movement *within* a PD is heavily restricted.

Even though I agree with Grohmann's generalizations and CDE, because they are both theoretically elegant and empirically adequate, I have already presented out attempt to derive both Locality and Anti-Locality from interface conditions, making them *principled* and conceptually necessary, and not rules that empirically apply but whose *justification* (in our technical sense) is obscure. Let us summarize the different possibilities for Spell-Out timing I have sketched so far:

Spell-Out applies for a term K:

a) At the merger of the *closest phase head* proceeding in a bottom-up fashion (PIC_1)
b) At the merger of the *next phase head* proceeding in a bottom-up fashion (PIC_2)
c) At the completion of the *Prolific Domain* to which K belongs (Grohmann, 2003, 2004)
d) Whenever a *fully interpretable object* for the interfaces (containing K) is assembled by means of free, unbounded Merge (Krivochen, 2010b, 2011b).
e) When the *Command Unit* in which K is merged is completed (Uriagereka, 1999, 2002).
f) Within a *transformational cycle* affecting K (Epstein & Seeley, 2002).

Notice that our definition is the only one that requires no additional notions or stipulations, it only appeals to the concept of interface conditions, which are conceptually necessary in a massively modular mind-brain. This is what I understand as *radical minimalism*.

5. The Theta Criterion:

Let us see how this conception of interface-driven movement interacts with Theta Theory. *Move α* and the Theta Criterion were related from the very beginning of GB theory. The trace at the bottom of a chain CH = ($\alpha_i \ldots t_i$) was always in a θ-position, and movement *to* θ-positions was banned since, although an element could bear more than one theta-role in its base position (as Jackendoff, 1983 pointed out), no theta-roles could be acquired in the course of the syntactic derivation, a condition that in minimalist terms could be expressed through the *Inclusiveness Condition*. Let us work with a revised minimalist version of the Theta-Criterion in terms of *chains* (Lasnik, Uriagereka & Boeckx, 2005: 229), and then present our extremely simplified scenario:

"Given the structure S, there is a set K of chains obeying the format C = ($\alpha_1 \ldots \alpha_n$), such that:

i) *If α is an argument of S, then there is a chain C in K such that a theta role is assigned to α_n, by exactly one position P.*

ii) *If P is a position of S marked with the theta-role R, then there is a C in K to which P assigns R."*

This definition maintains the traditional conception of "no acquiring theta-roles in the course of the derivation", as a position P can only be theta-marked with *one* role. Besides, the fact

that only the merge position receives a theta-role is included in the definition by saying that a role is assigned to α_n, the lowest member of the chain. It is a position in the syntax that is theta-marked by a lexical nucleus, not a particular DP.

The status of theta-roles remained quite unclear until the works of Hornstein (2001, 2003). His basic tenets are the following (2003:22):

a) *Theta roles are features*

b) *There is no upper bound on the number of theta features that a DP can have*

c) *Movement is Greedy*

d) *Greed is understood as "enlightened self-interest"* [i.e, *MOVE allows A to target K only if a feature of A* ***or*** *K is checked by the operation* (Hornstein, 2001)]

Given the fact that theta-roles are features, and all operations are allegedly feature-driven (Chomsky, 1998), it follows that theta roles can motivate movement and internal merge with a [-N] element. In theta-motivated movement, a DP moves in order to check a feature in both the [-N] element and itself. Of course, for (b) to be true, either (i) or (ii) should be accepted:

i) Theta-features are not deletable

ii) An element can move even after having checked all of its features if a higher probe K with a theta-feature attracts it and Minimality is respected (this is, there are no *freezing* effects).

Both are optimally dispensable in a Radically Minimalist theory, as well as theta-roles as have been analyzed so far, both in GB (Chomsky, 1981, 1986) and in Minimalism (Hornstein, 2001, 2003; Grohmann, 2004). Our thesis in Krivochen & Kosta (2011) was that *the thematic system has to be subsumed to the Case system*, building on DeLancey's (2001, Lecture 3) claim that:

> "(…) *suppose we could demonstrate that there are, say, exactly x universal semantic roles which can occur as core arguments in a clause in human language.* ***The most obvious language design would have x case markers, one for each underlying role****; every argument would simply be marked for its semantic role, which* ***could then be read directly off the surface morphosyntax*** (…)"

In previous works (Krivochen, 2011b) I have distinguished three Case spheres, Nominative, Accusative and Dative. Within those spheres, both clear-cut examples of each Case and "intersective uses" of a Case can be found, examples in which the Spell-Out of a Case morpheme appears where a different phonological expression would normally be expected (e.g., ECM structures, quirky Dative subjects, etc.). Despite Spell-Out issues, abstract Case is taken to be a potentiality of {D} structures, comprising *in abstracto* all three possible outcomes but collapses to one of them in a particular derivation, in a local relation with a procedural head or due to cumulative influence of procedural heads (Krivochen, 2011b). Theta roles have no entity of their own, that is, there is no independent system for theta roles: they are *semantic functions read out by the inferential component from the syntactic configuration that is transferred* (by phases) *to the semantic interface* (LF in terms of Relevance Theory). A *theta-role* is the configurational result of three factors:

a) The underlying *semantic construal*, the structure made up from *generic concepts* that provides semantic instructions to syntax as regards what it has to generate, constrained by the Conservation Principle.

b) The outcome of the abstract Case dimension.

c) Spell-Out, interpreted in two different senses:

   i) Sub-morphemic Spell-Out (root, inner morphemes, Case morphemes)

   ii) Position in the linearized clausal structure

Taking this into account, these conclusions follow:

- As theta roles are only relevant post-syntactically, they cannot be "features" as in Hornstein's model. Syntax only cares about merging elements with the same format together. All semantic relations are post-syntactic but licensed by a syntactic configuration.

- As a consequence of the previous statement, even in a feature-driven model, *theta-driven movement* cannot exist.

- There are no theta-positions (or A-positions and their respective counterparts, following this logic. See Putnam, 2011), there are *positions*, period. The interpretation of the structure is at the LF level, in other words, it is true that, as Mateu (2000a, b) and Hale & Keyser (1993 et. seq.) claim, the structure is meaningful, but it makes no sense talking about meaning *in* the Computational System as it is a "dumb machine" ***purely generative, not interpretative***.

6. Conclusion:

In this paper we tried to analyze Movement in three levels: *description, explanation* and *justification.* Whether we have been successful or not, is still to be proven. In this conclusion, we will sum up the main ideas of the paper:

i) All operations are interface-driven, and *every derivational step* must be justified in terms of generating a legible representation (*Dynamic Full Interpretation*).

ii) Movement, in terms of "interpreting something in a different place from which it is phonetically realized" (as opposed to movement interpreted literally as "displacement of a SO") is triggered by interface reasons, like *themehood* or *presuppositions*, what we have called "drastic interface effects". All the same, we state the pre-eminence of the semantic component over the phonological component. The generative engine, needs semantics to have something to manipulate[11], but can perfectly dispense with phonology, as externalization is not a *sine qua non* condition for syntactic manipulation of symbolic objects.

iii) The strong version of RM posits that:

Agree *is impossible if one does not have features (i.e., valued dimensions, see Uriagereka's comments to Chomsky, 1999), and it should be replaced by interface reading algorithms. Dependencies must be read from the structure without adding stipulations.*

[11] As Immanuel Kant points out, in his Critique of Pure Reason, "*Gedanken ohne Inhalt sind leer, Anschauungen ohne Begriffe sind blind*".

*Nothing "moves" in a literal sense, LA contains **types** and the number of needed **tokens** is determined by the **Conservation Principle**.*

I would like to conclude with the SRMT, which was our guiding line throughout the paper and, hopefully, a door to interdisciplinary studies including Linguistics, Physics and Mathematics:

Strong Radically Minimalist thesis (SRMT):

*All differences between physical systems are "superficial" and rely only on the characteristics of their basic units, which require minimal adjustments in the **formulation** of operations and constraints. At a **principled level**, all physical systems are identical, make use of the same operations and respond to the same principles.*

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