Affixes, Roots and Materialization:

Quantum Linguistics meets Morphophonology

Diego Krivochen, UNLP. E-mail: diegokrivochen@hotmail.com

0. Introduction:

In this paper we will try to outline a theory of the syntax-morphophonology interface, departing from the assumption that the phonological ordering of elements in a word-level organization is not random but principled, and those principles are third factor principles, which means simplifying the theory in both a substantive and a methodological level. Our framework will be, as usual, Radical Minimalism (Krivochen, 2011a et.seq.), and we will also draw some concepts from physics with the conviction that language is a part of the natural world, and thus it must obey certain basic physical principles. These considerations will lead us to review the *Agree* system once again, refining the concepts we have been using in RM like *Collapse* and *Influence*. The objective is a stipulation-free theory of mental faculties, with special focus on language.

1. General considerations:

We depart from a unique generative operation, Merge, which we define as follows (Krivochen, 2011d):

a) ***Merge** is a **free unbounded operation** that applies to **two** (smallest non-trivial number of elements) distinct objects sharing format, either ontological or structural. Merge is, on the simplest assumptions, the **only generative operation in the physical world.***

Types of Merge:

1) Merge (α, β), $\alpha \neq \beta$ –but α and β share format- *Distinct binary Merge* (Boeckx, 2010a; Krivochen, 2011b, c)

2) Merge (α, β), $\alpha = \beta$ *Self Merge* (Adger, 2011)

3) Merge (α, β, γ…), $\alpha \neq \beta \neq \gamma$ *Unrestricted distinct Merge*

Elements Merge freely in the working area, all constraints being determined by interface conditions. So far, we have focused on LF interface conditions, which we take to be constraints on legible structures for explicature purposes, drawing the concept from Relevance Theory (Wilson & Sperber, 2003 and Yus, 2010 for an overview of the theory). We have outlined a theory of Merge and labeling with semantic basis (Krivochen, 2010a et.seq.)

but we have not paid much attention to the S-M side of the question. We will devote this paper to some problems in the syntax-morphology interface, which, in turn, will lead us to review and problematize some claims that have a long history within *internalist* studies of language.

We will focus on the phonological ordering of *inner morphemes*, which we have defined as "*the Spell-Out of functional nodes as affixes*". Besides, "*A dimension in a functional head may not be Spelled Out as a "strong affix" (a word, strong enough to stand on its own and carry prominence, for example), and, instead, appear within the phonological limits of a word; or appear both as an independent word and an affix*" (Krivochen, 2011d). Before getting fully into the topic, some assumptions we will draw on during our inquiry:

b) *Categories, phases and other units are not primitives of the syntactic theory, but arise as a result of the interaction of a free Merge system with interface conditions: the dynamics of the derivation and the biologically-determined legibility conditions of certain mental faculties or any other computational module.* (see Krivochen, 2011d, De Belder, 2011, Boeckx, 2010).

c) *There is* ***no distinction between "lexical derivations" and "syntactic derivations", and this goes beyond the positing of a single generative mechanism: there are just derivations in NS****. No pre-syntactic generative lexicon and no constraints on Merge. Our analysis of IM and "categorization" has shown that many distinctions that have been posited in the last years are actually epiphenomenic.* (for the historical basis of this claim, see Halle & Marantz, 1993. See also Hale & Keyser, 1993 for the first attempts to distinguish between l- and s-syntax).

In our previous works, we have posited a single PF-condition, namely, the *Morpheme Formation Constraint*:

d) ***Morpheme formation constraint***: *We cannot group features in a terminal node (i.e., morpheme) if there is no vocabulary item in the B List specified enough to be inserted in that node.*

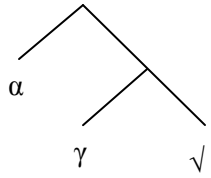
Corollary: *Given two sub-morphemic terminals, X and Y; relations of phonological precedence will not be determined by syntactic principles but by the availability of Vocabulary Items to Spell Out those terminals* (Cf. Embick & Noyer, 2004).

This is: if a language L does not have a single VI that can Spell-Out [manner] and [motion], then there will be no Path of Motion constructions, since those two primitive features could not be grouped in a single terminal node. This is our non-parametrical way of accounting for the *Verb-framed / Satellite-framed* difference that is analyzed by Mateu (2000, 2008). Notice, incidentally, that we have said "constraint" and not "principle": this is because,

since Merge is free, there is no principle constraining node conflation. If MFC has any descriptive adequacy, it is because it accounts for a synchronic state of L, but not the original forms, or the logics behind what is apparently random and mischievous in word formation. Those original forms, the historical origin, obeyed syntactic principles, which we will try to analyze.

2. Prefixes and Suffixes:

In a free Merge scenario, as the one outlined above, there is only "*one syntax*", so derivations are built in a single workspace, as opposed to generative lexicon-narrow syntax. Of course, our model allows for parallel derivations, a case for which we have done in Krivochen (2011b). Categories emerge from the local interaction between a root and a procedural node, as in:



Assume that γ is not an intervenient node for Minimality effects and α is our procedural node. The local relation between α and √ is interpreted in the semantic interface as a "category". It is now time to define what a root is, according to Radical Minimalism (from Krivochen, 2011c):

***Roots** are **pre-categorial** linguistic instantiations of **a-categorial generic concepts** from C-I. Generic concepts are "severely underspecified", since they are used by many faculties, and therefore cannot have any property readable by only some of them; otherwise, the derivation would crash in whatever faculty we are considering* (cf. Boeckx, 2010; Panagiotidis, 2010). *Roots convey **conceptual** instructions, whereas **functional nodes** convey **procedural** instructions to the post-syntactic semantic parser.*

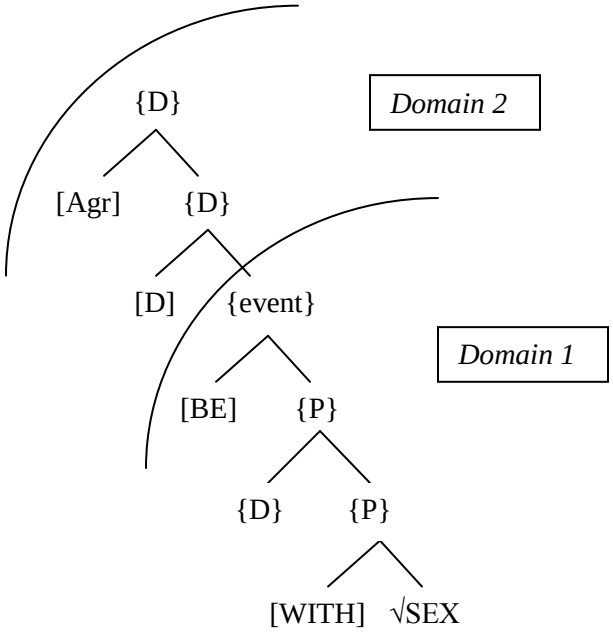
However, things get more complicated, since the number of non-intervenient nodes is potentially infinite, and there has to be a phonological order of precedence among those nodes. Let us take the following example:

i) Sexyness

Embick & Noyer (2004) propose a linearization procedure LIN (X, Y) = (X*Y) / (Y*X) (where * means phonological precedence), but the possibilities grow when we have more than two nodes to linearized, giving us an *n!* situation, which is not what we would want since there is no interface condition that can orient us towards the preferred option(s). The optimal scenario would be that in which interface relations are based upon *pre-existing relations*, namely, those created in the syntactic configuration. Let us assume that that is actually the case, following Uriagereka (1999). In this case, Embick & Noyer's LIN would be limited by *interface conditions*

(i.e., third factor principles), which is the best of possibilities. The syntactic structure builds *informational domains*, as claimed in Krivochen (2011b), which are relevant to C-I. We will try to show that those domains have influence on the PF representation as well. The structure would be as follows:

ii)



What do these domains convey? Notice that the most embedded domain is not {P, {D, √}}, but {P, √}. This is because we want to generate the adjective [sexy], not the noun [sex]. Adjectives, as we have already claimed in Krivochen (2011e), are *unaccusative structures*, atelic in this case since we are dealing with an *individual level predicate*: a {D} element, a *generic* [THING] in this case, is in an abstract location, a property. The derivation does not end in the unaccusative event, though. The merger of {P, √} receives a categorial interpretation, and {event, {P, √}} is an informational domain in itself. However, it is underspecified, since we could perfectly merge a T node on top and we would have a verbalized structure. Instead, we have [D], which is the procedural node that carries the nominal weight. This structure is in turn merged with an Agr node, just for the sake of explanation, to give [sexynesses]. In Spell-Out terms:

iii) Sex – y – ness – es

Root *P* *D* *Agr*

How do we explain the ordering of nodes in this case? Our thesis will be that *the nodes are spelled out mirroring the relation they maintain with the root, from the closest to the most detached*. From this claim, we derive that

procedural nodes always have a closer relation with the root than peripheral nodes like Agreement, as they generate categorial interpretations in the semantic interface. However, abandoning Kayne's LCA in favor of this alternative implies that *both* interfaces are somehow sensitive to similar factors, which seems to be quite hard to prove (we will come back to this in a moment). The obligatory question at this point would be: how are derivations built so that the adequate node is in the adequate place to have scope over the root? Here is when the Conservation Principle comes into play:

a) ***Conservation Principle****: Dimensions cannot be eliminated, but they must be instantiated in such a way that they can be read by the relevant level so that the information they convey is preserved.*

If we depart from the conceptual unaccusative structure depicted above (see Mateu, 2000a, b), then there is no other way to build the (narrow) syntactic structure, or CP would be violated. If we take the position that language is part of the natural world seriously, then the same principles that apply to other physical systems should optimally apply to Language. CP is a well-known principle in physics, and we have adapted it to be useful for linguistic research.

3. <u>Morphology and atomic theory:</u>

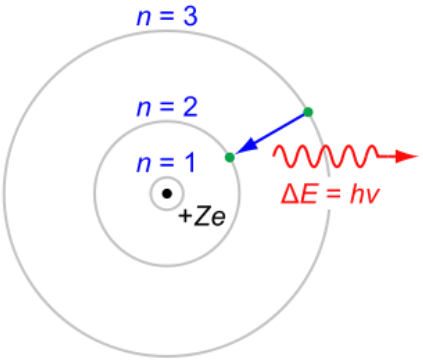
In this section we would like to introduce a whole new approach to the relation between the root and its "associates": inner morphemes and affixes.

Let us think of the lexical structure as an atom, with a nucleus and elements moving around it in different levels. The closer to the nucleus, the less the energy. We are going to take two well-known models to illustrate the historical process of affix change:

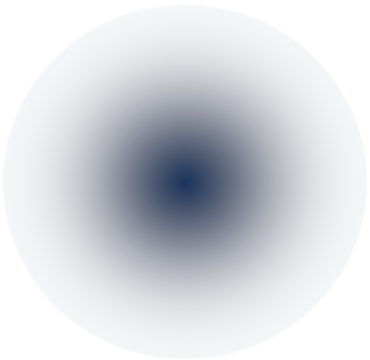
a) *Niels Bohr's model:* the nucleus in the center, and electrons moving in fixed circular orbits around it. Electrons can change their orbit, jumping to an orbit closer to the nucleus and liberating energy.

b) *Current (quantum-based) model*: electrons move in energy *areas*, not fixed circular (or even elliptical) orbits.

(a)



(b)



In the second model, there are no fixed orbits, so that levels are fuzzy areas, and conditions on movement change towards a more quantum-like model. What are the implications of adopting one or the other model for exemplifying lexical structure? The first has very fixed areas, which could go with the time in which word-formation was fixed, the time in which older words were coined by using procedures that were inherited, for example, from Latin. The root is in the center and affixes are "orbiting" around it in a fixed, syntactically-determined logical way. The second model, on the other hand, can be used to depict the actual situation, in which there is a root in the center and affixes appear in zones of influence, which are apparently related to their being Spelled-Out before or after the root, and in which order. But, since the mechanisms have been fossilized, what was once a purely syntactic process now is highly influenced by socio-historical factors. This fact may be interpreted as supporting Uriagereka's (1998) claim that lexical formation is not syntactic, as it is not *productive*, *transparent* and *systematic*, but that is a consequence of the influence of extra-linguistic factors on the B-List, not an inherent property of the system. In Coseriu's terms, we can say that *the primacy of the **system** has been put in the second place, and historical developments put (arbitrary) **norms** in the center of the scene*.

We have to be clear on one point here: the relation with physics is ***not a metaphor***. We are not making a "reductionism" of linguistics to physics, as it may seem, simply because if language is a physical system (i.e., a part of the universe), then it can be studied by a branch of physics. Thus, instead of deriving linguistics from social psychology (Saussure) or biology (Chomsky), we derive it from *physics*, and try to account for physical and mathematical properties of mental faculties, an enterprise that includes a biological study, but does not limits itself to biology.

4. <u>A note on prefixes:</u>

We take *all prefixes to be spelled-out Ps*, as there is always a *locative* meaning involved, which establishes how the root is to be interpreted. Extending the hypothesis, affixes in general are *procedural nodes*, functional terminals that have scope over roots' underspecified generic semantic content. Even *polarity* prefixes (dis-, un-), and *aspectual* prefixes can be taken to be Ps, despite their highly abstract meaning:

Dis- = [$_{\text{Path}}$ OUT OF [$_{\text{Place}}$ WITH]]

En- (inchoative aspect) = [$_{\text{Path}}$ TO [$_{\text{Place}}$ WITH]]

The question is: why are they materialized at the beginning of the word? One possible answer is that there is morphophonological movement *à la Nanosyntax* so as not to intervene in the local relation root-procedural head (D or T), taking as valid that the root is within the {P} structure, as depicted above, and thus closer to P than to D/T. This option banns spell-outs like:

*√red-*en-des-ar* (for *desenredar*, "untie")

As a descriptive generalization, this could very well work for the origin of prefixed words, but once the procedure has became fossilized, ***creativity sticks to analogy, not to logic***. This is why we have apparent counterexamples, which are actually "modern" in their origin. Now, there is an essential question to be asked: *why would SM be sensitive to scope and local relations?* Two possible answers come to our mind:

a) S-M has access to C-I

b) S-M operates in an analogous way to C-I

(a) goes against the tenets of Massive Modularity, to which we stick for the moment (at least for the *interpretative systems*, see Krivochen, 2011d), so that we will avoid that option if possible. (b), on the other hand, seems more plausible since, although it has been claimed that PF is the source of all variety and irregularity in language, the optimal scenario would be that in which both C-I and S-M are ruled by third factor principles. Claiming that SM is somehow different from C-I implies a stipulative distinction among interpretative systems which is taken for granted in Chomskyan work. So, morphophonological operations apply in S-M just as post-syntactic computations apply in C-I for explicature / implicature building (Wilson & Sperber, 2003, Krivochen, 2010a). The MFC is an S-M interface constraint on otherwise free Merge, as explicature building requirements are C-I interface constraints. Interfaces "peer into" syntax, and *Analyze* the output of every derivational step (Krivochen, 2011c). Merge, then, is free and unbounded in the working area, but the ill-formed products (in interface terms) are filtered out after transfer, if the violation could not be repaired in the next derivational step (see Putnam, 2010, for a soft version of "crash", related to this claim).

4.1 Affixes and Roots:

In this section we will discuss a possibility that has been suggested by De Belder (2011), namely, *affixes are roots*, and not functional / procedural elements, as we claim. We will give some theoretical evidence in favor of her hypothesis, and then justify our contrary position, so that the reader can decide between both options.

De Belder's claim is that affixes can have many different meanings and some of them stretch "well beyond functional meaning" (De Belder, p.c.). In this sense, they allegedly share characteristics with conceptual categories rather than with procedural categories, since only the former are "malleable" (Escandell Vidal & Leonetti, 2011: 4):

"(…) *In the cognitive pragmatic tradition, it is common to assume that conceptual representations are flexible and malleable, which means that they can be enriched, elaborated on and adjusted in different ways to meet the expectations of relevance. All the interpretive phenomena that are usually considered as instances of meaning*

modulation and ad hoc concept formation stem from this basic property (Wilson 2003, Wilson and Carston 2007). We claim that instructions, on the contrary, are rigid[1]*: they cannot enter into the mutual adjustment processes, nor can they be modulated to comply with the requirements of conceptual representations, either linguistically communicated or not.* (…)"[2]

In our (2011c) paper we identified conceptual categories with *roots* since, as they are semantically underspecified, their interpretation is shaped by the procedural categories that have scope over them. If affixes are as malleable as De Belder claims, then they *must* be roots, and Escandell & Leonetti's quote supports her view. However, there are some problems with this proposal:

- If affixes are roots, and therefore malleable, which node provides the procedural instructions that narrow the possible interpretations?

- RTNs cannot be merged to one another as they are empty sets, so *ad hoc* FPs are posited, thus violating, to our understanding, Dynamic Full Interpretation: {Ø} and {F, {Ø}} are equally legible (if Ø is legible at all, which is not clear to us as it provides no information for explicature building).

In our proposal, affixes are *procedural nodes*, thus, they *cannot* be roots. The main reason is that they provide C-I with instructions as to how to interpret the generic content of a root, which is there from the very beginning of the derivational path (because of the Conservation Principle). Prefixes are Ps and suffixes tend to Spell-Out {event} / {cause}, both of which have scope over the root, and thus *categorial interpretations* are licensed. Notice that, if prefixes are Ps, we are adopting a version of the *locative theory*, which claims that conceptualization is essentially and primarily *spatial*. We see that procedural instructions like Polarity and Aspect can be expressed ultimately in locative terms, as well as fine Aktionsart distinctions. Of course, some fine-grade flavors are inferential, but we have seen in previous works (mainly, Krivochen, 2010a) that inference is pre-sub-determined by the syntactic configuration: there is nothing in the inference that is not there in the syntax (because information cannot be created or destroyed, just transformed, as it is ultimately *energy*), but the inferential component can re-parse an LF (in Relevance Theoretic terms) if the first and more accessible option does not fulfill the Relevance expectations. The debate is now set, in whole new terms.

[1] Note the parallel with early DM (Noyer, 1998): f-morphemes' Spell-Out was said to be "deterministic", whereas l-morphemes' Spell-Out was free.

[2] Procedural instructions, for example, force the semantic component to adopt *ad hoc* propositions to understand an utterance. See Escandell Vidal & Leonetti (2011: 7).

4.2 A potentially interesting generalization:

The behavior of affixes is subjected to a certain logic, as we have claimed throughout this paper. Now, we will focus on a generalization that has to do with affixes and verb typology. Let us see the following examples:

i) *Em*power

ii) *En*rich

iii) *En*throne

iv) Hard*en*

v) Dark*en*

The first three verbs are transitive ((i) and (ii) are *locatum V*, whereas (iii) is a *location V*), and the last two are intransitive, ergative Vs. This means that the relational semantic structure of (i), (ii), and (iii) has both an {event} and a {cause} primitive, whereas (iv) and (v) only have an {event} primitive, since ergative Vs are *uncaused*. Apparently, it is the presence of the {cause} primitive what triggers the PF process. But why? Our theory of *Informational Domains* may have the answer. {cause, {event}} is a fully-fledged informational domain, regardless of its distribution (that is, under a D node or a T node), whereas {event} might be said to be a "defective" domain, as it lacks external cause (though one may very well argue that there are also *internal* and *environmental* causes, so that "the cellphone moved" would be internal cause –as the phone has an internal device that licenses that movement-, but "the ball rolled down the hill" would be environmental cause, since it is a feature of the phenomenological world that licenses the action). If this theory is correct, then the alternation prefix-suffix can be explained in the same terms we have been working with: something moves to get out of the way in a local relation, so as not to violate Minimality.

4.3 Some unsolved problems:

Our initial idea was that Spelling-Out Path & Place separately was not possible, based on the following:

**un-/dis-* hard *–en*

If our claim that *dis-* is actually composed by Path & Place is correct, then this example is perfectly explicable within our framework. However, we came across examples like:

i) *Des-en*-redar (location)

ii) *Des-en*-fundar (location)

It is possible that our initial idea works for uncaused Vs, whereas caused Vs, having a more complex conceptual and syntactic structure, are subjected to different conditions. However, it is not clear at all. There are examples of location Vs in which the procedure is not productive:

iii) **Des*-*en*-jaular

However, in English the same word is possible:

iv) *Un*-cage

Of course, there is only one P node Spelled-Out there, and that may have some influence.

The only conclusion we have for sure is that *prefixes are Ps, and any further specification or finer-grade distinction is made* ***inferentially****, post-syntactically, based on the syntactic configuration that is transferred to the interface*.

Another question that remains open is whether the nature of the P node is relevant as well as {cause}: Locatum Vs have a central coincidence relation [WITH], whereas ergative Vs have a terminal coincidence relation [TO]. Here we get into the problem of defining location & locatum, as there are borderline cases (see Uriagereka, 1998):

v) *En*-marc-*ar* (to frame)

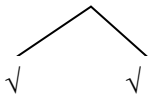
The question is: are we putting something inside a frame or a frame around something? (that is, is it a *locatum* or a *location* V?) Anyway, the negative form **des*-*en*-marc-*ar* is disallowed. Our native speaker intuition tells us that those forms are disallowed and other forms are not, but this can be merely a matter of being part of a speech / linguistic community.

5. <u>A note on compounds</u>

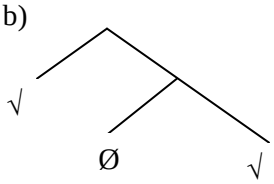
Compounds, in our theory, are not formed in the syntax every time we have to use them if the word is already coined. That means that coined compounds enter the derivation as a single root, rather than arising from the combination of two or more roots. However, there is a time in which a compound is built, and that is what we are going to analyze now.

There are two possibilities for representing the syntactic structure of a (yet) non-coined compound:

a)



b)



We will do away with the first one, since there is no procedural element to indicate the relation between both conceptual elements (i.e., roots). In the second representation we can see a null (or not) procedural node, which provides instructions to C-I as to how to manipulate the conceptual content conveyed by roots.

We claim that there are two types of compounds:

a) Those compounds in which there is no "semantic requirement" involved (A-structural).

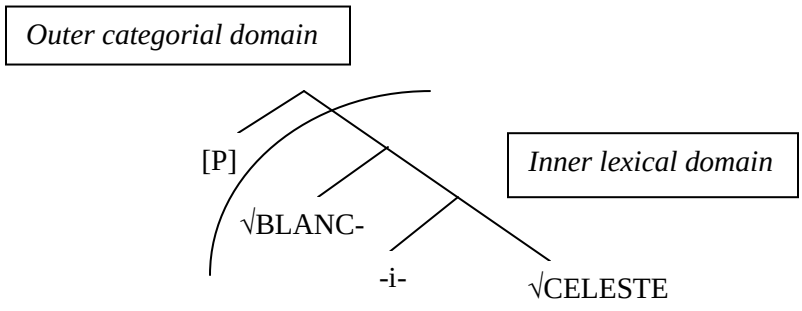
b) Those compounds in which there appears to be a "semantic requirement" involved.

Consequently, there are two main structures for compounds. We will analyze each in turn.

1) Azulgrana, albinegro/a, blanquiceleste, teórico-práctico/a, físico-químico/a.

2) Lavarropas, parabrisas, sacapuntas, secarropa, sacacorchos.

In the (a) group, we have two roots related by means of a procedural node, giving us a representation very much like those of De Belder (2011), but substituting the interface-dubious FP by a full procedural node that can be realized phonologically. The overall interpretation of the compound is that of a *noun* or an *adjective*, depending on the procedural head that is merged at the top, D or P respectively. Regardless categorial issues, what we have here is an *eventive unaccusative construal* (see Krivochen, 2011e). Let us take a look at the derivation:



The introduction of the root √CELESTE in the workspace generates a non-legible object for the semantic interface, as roots are underspecified. However, as there is no transfer, no problem arises. The introduction of the

procedural element *-i-* is very relevant at this respect, since it licenses the presence of a second conceptual element. Being a procedural linker by nature, this element is *relational*, and there must be something to relate. The syntactic object in the inner lexical domain is a fully-fledged *relational* (i.e., spatial) "projection" (taking into account that there are no heads or projections in our system), but it is not fully interpretable, as there is no procedural node that generates a *categorial interpretation*, which is necessary for explicature-building purposes. Therefore, the merger of a procedural node at the top is necessary, triggered by *Dynamic Full Interpretation* and following Putnam's (2010) *Soft Crash*. This procedural node would be the local derivational unit that fixes the violation in a syntactic object α, being α the inner domain.

Now, for labeling purposes, can Ø "project" (with all due comments about labeling and projection made)? If it is *radically empty*, as in De Belder's work, it cannot project. Two main reasons come to our mind:

a) If *Label* is seen as essentially *Copy*, then there is nothing to copy "upwards".

b) If *Label* is seen as an interface-driven recognition operation, then there would be nothing to recognize. The derivation would crash.

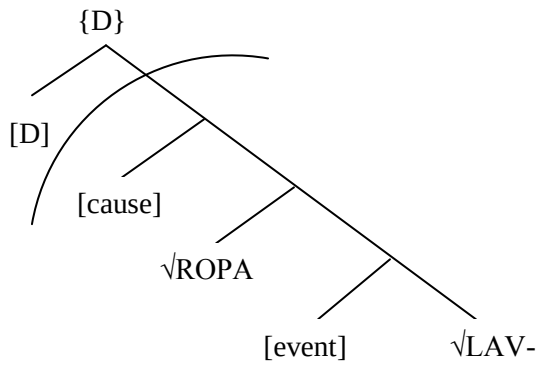
However, we have said that there are procedural dimensions in Ø, then those dimensions (basically, some instruction saying "there is a paratactic relation here") are recognized by the interface as the label, as if it were a {P} construction, with its (conceptual, not syntactic) *figure* and *ground*. It is time to ask ourselves: is this an optimal solution? No. Why? Because there is no reason to posit a label there anyway. In fact, things work better if *no label is posited*, and the structure remains active until either P or D are introduced in the working area, which are well-known categorial interpretation generators. This allows us to:

- Procrastinate C-I evaluation and *label* recognition.

- Procrastinate *Transfer*. In this way, we account for effects of *inner* and *outer* morphology without making reference to phase heads (Cf. Marantz, 2008), but sticking to our non-stipulative system-neutral definition (Krivochen, 2010b, 2011a, b, c):

  P is a ***phase in*** $\boldsymbol{L_X}$ *iff it is the* ***minimal term fully interpretable in*** $\boldsymbol{L_{X+1}}$.

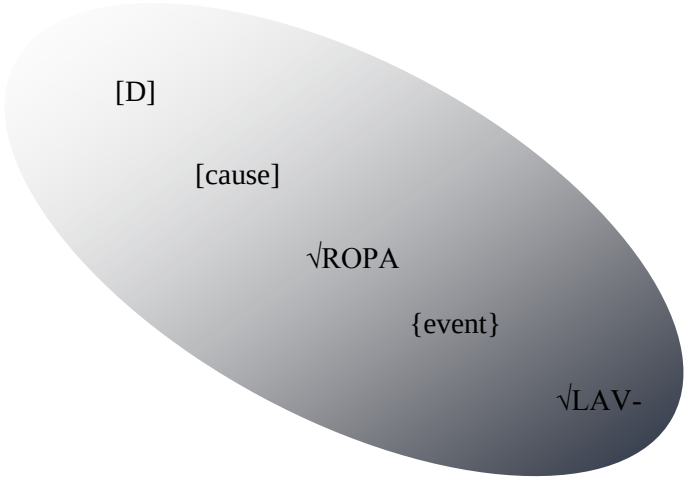
Now let us turn our attention to examples in group (b). Those examples are *caused compounds*, that is, there is a [Cause] primitive involved, and the resultant compounds are interpreted as if there was some semantic selection within. However, we have dispensed with features of all kinds, specially (categorial or semantic) selectional features. These imply a strong restriction for Merge, and we have made a case for *Free* Merge in our previous works. The structure we posit is the following:



A question is in order here: do *caused* compounds license an external argument or initiator? That is, is the structure as we posit or actually [*pro* √lava-√ropas]? We believe not. Remember that there is no [EPP] or anything like that, so there is no "*every clause must have a subject*" *a priori* constraint or requirement. As far as we are concerned, the interpretation of an external argument is purely inferential, as there is a {cause} node involved. This interpretation is a kind of "generic interpretation", since it is impossible to restrict its reference (as there is no *Split T* above, see Krivochen, 2010a). This leads us to an interesting conclusion: *eventive compounds are* ***thetic***, that is, there is no *theme* (in informational terms). Remember that we have posited that the so-called "subject position" (i.e. Spec-TP) is a thematic position, and movement is semantically motivated, to interpret an element in that position as *theme* of the clause. No external position (Spec-*v*P, Spec-TP, the reader may choose) means no theme, which is a desirable result.

Now, we have to account for the mechanisms that, *in illo tempore*, before coinage, ruled affix order. Let us make use of theoretical physics again (and, again, no analogy, but direct application of the concepts). We have said that the most embedded root was the nucleus, and all the other elements are orbitating around it in different levels. This representation is no more arbitrary than trees, and it captures the same properties, so let us work with it for a while, to see to what extent it is compatible with tree-like representations. There is no reason to adhere to one symbolism and not to the other, as both are representations. What is more, we think that the idea of a nucleus around which other elements "move" is different areas according to the syntactic-semantic (we claim that semantics is a function of syntax) relation they maintain with the nucleus, which is by no means a *head* in traditional terms, but a *nucleus*, this having the only sense that the element is "at the center". This, as will be clear in a moment, has also consequences for the theory of *Agreement*, in all of its forms (upwards, downwards and both-sided).

Let us see how we would combine both representations, taking the best of each:

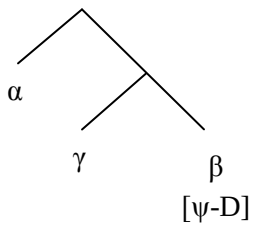


We see that the darkest zone represents the nucleus of the structure, and the other elements are disposed in outer levels. We could have used a circular representation, as the one above, but it is essentially the same. What we are trying to say, among other things, is that structures are not two-dimensional, but that it is possible that syntactic structures are represented in the mind as nuclei with peripheral elements in a three-dimensional space, if we do not take into account *time*, the fourth dimension. It is highly unlikely, for us, that the mind operates in 2-D, as it would represent a serious limitation for perception and conceptualization. ***No heads, no features, no projections, but a radically simple phrase structure built in real-time and manipulated as any other object in the physical world.***

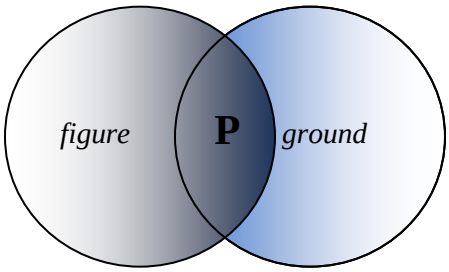
6. Agreement versus Influence:

In this section we will expand on a concept we have used in our 2011a paper, but has not have proper development ever since. We will describe the mechanism of *Influence* and compare it with several versions of the traditional Minimalist operation *Agree* (*upwards probing*, *downwards probing* and *bi-directional probing*).

Bear in mind that in Radical Minimalism there are no features as traditionally conceived, [± F] but quantum dimensions that, *in abstracto*, comprise all possible outcomes of the relevant dimension. For example, [$Case_X$] comprises NOM, ACC and DAT (Krivochen, 2010c, 2011a). In our system, a dimension in its ψ-state collapses in a local relation with a procedural node. The standard schema for collapse, a sub-type of *Influence* is the following:



We have said that α makes the quantum dimension in β collapse if and only if γ is not an intervenient element for Minimality effects. Although we stick to that definition, we would like to present a new approach to our quantum theory now. Dimensions enter into mutual influence relations when their influence zones overlap. Think of this as throwing stones to calm water: circular waves generate, and sometimes those waves intercross. There we have a very interesting type of influence that *Agree* has neglected. For example, we have claimed that the nature of the relational node [P] is not determined *a priori*, but depends on the interpretation of the elements that are merged with it. In the terms we are using now, on the elements that are orbitating closer in the 3-D structure. In terms of *spheres of influence*, the graphic would look like this:



How can we account for P phenomena in this way? Note that, even though the *figure* has been merged later on, and therefore is "on top", the *ground* also affects the P node. In traditional "merge terms", this would look like:

i) {√ ,{**P**, √}}

Where both roots affect the interpretation of P. This means that, contrarily to common assumption, it is not the nature of P that determines the relation between figure and ground and therefore verbal typology in *Location* / *Locatum* construals. What we see instead is that the procedural content of P is not fixed beforehand, but determined compositionally *in the syntax-semantics interface*. In other words, the *conceptual content of roots determines the interpretation of coincidence as central or terminal*, rather than a pre-fixed structural template.

Influence α must not be taken as an operation, but as the result of certain configurations that arises in the *syntax-semantics interface*. This way, the sphere of influence of an element is not limited to its "domain" (which, if defined upon c-command runs the risk of becoming a representational notion, with little place in a strongly derivational theory), but extends upwards and downwards, its boundaries being determined by Optimal Relevance (Wilson & Sperber, 2003) rather than limiting themselves stipulatively to the first available goal. Of course, both may coincide, but the problem is theoretical justification rather than visible effects. *Influence* is not a constraint on Merge, since it is read in the semantic interface. Therefore, it is perfectly compatible with a *Merge α* system like the one we have built. Collapse and category recognition, both *interface readings* (see

Krivochen, 2011a, b, c), are read top-down, but that does not mean that it is the only allowed relation in our system. In this respect, we are close to *bi-directional probing* (Putnam & Stroik, 2011), but we have eliminated features from the picture, so there is no probing, and there are no probes or goals either. The concept we see subjacent to the whole *Agree* machinery is that syntactic objects are somehow related, and interpretation needs that those relations occur in a local space. Notice that we maintain the concept, but change the operationalization completely to make it more simple and economical. Impoverishing syntax and refining the semantic interface theory we aim at a simpler minimalism, both methodologically and substantively. If the scope of *Influence* is determined by Optimal Relevance, as we think it is, then we are talking about third factor principles and not specific syntactic constraints. This is another highly desirable consequence of adopting our framework.

6.1 Multiple Agree and Cumulative Influence:

Orthodox Minimalism allows for a single probe to establish a relation with multiple goals, as in expletive constructions. In those structures, apparently, T_0 would check φ-features with both the expletive and the associate, but only the latter values a Case feature as a result of the operation. The former, being structurally closer to T, is the element that satisfies the EPP feature in T and thus rises to the "subject position". The mechanism is explained in Chomsky (1999) -to which we refer the reader- and we will not go deeper into it, but compare it with our own proposal of *Cumulative Influence* (Krivochen, 2011a). From Krivochen (2010a) on, we have put forth a theory of reference in which definite {D} constructions are not uniquely referential *per se* or because of their form (*contra* Russell and his "theory of Definite Descriptions"), but definiteness and referentiality are post-syntactic readings of a structural configuration, in which procedural nodes T(ime), Asp(ect) and Mod(ality) play an essential role. Thus, *the mere presence of a definite article "the" does not entail or presuppose existence and / or uniqueness in any way in isolation, but inserted in a meaningful syntactic structure* (*à la* Hale & Keyser) The interesting thing to consider is that it is the *combination of the procedural instructions of the three nodes* that determines the most accessible interpretation for the semantic component, i.e., *explicature building* processes. What we allow, therefore, is that *multiple "probes" influence a single "goal"*, in traditional minimalist terms. Of course, the opposite situation is also allowed, since the influence sphere of a node extends until Relevance expectations are fulfilled: in this way, a node can influence an *n* number of nodes "above" and "below" it[3]. *Influence* areas determine *Informational Domains*, which we have already analyzed deeply (Krivochen, 2011b), and compared with Grohmann's (2003, 2004) *Prolific Domains*, so we will not go deeper into this.

[3] We have put *above* and *below* between inverted commas because those terms make reference to the traditional tree scheme. If we consider the atomic phrase structure model, then we should have said "inner" and "outer" elements with respect to the nucleus.

7. Conclusion:

We have tried to support our claim that phonological order is a function of the syntactic configuration, and that, originally, coinage procedures were determined by "syntactic" principles (which are actually third factor principles, like *locality*). In the history of a language, there is a very important but rarely noticed change towards production by *analogy*, once a pattern has proven highly productive. Our study has focused on the first stage, as the second can be seen as a natural change from analytic to synthetic, from derivation to representation. This change means less computational cost, but at a high price for linguists: obscurity in morphology. We think, however, that all forms can be explained if adequately "translated" into the primitive and essential syntactic pattern, which the B-List of each language licenses. Our analysis might well be wrong, but we are convinced that looking for principled reasons why prefixes are prefixes and suffixes are suffixes. This amounts to saying that *the functioning of language in the mind-brain is not arbitrary, but depends on interface conditions*, which is a plausible claim and, what is more, the optimal scenario if proved correct.

8. Bibliography:

Abney, S.P. (1987) *The English Noun Phrase in its Sentential Aspect*. PhD Thesis, MIT.

Acedo-Matellán, Víctor & Jaume Mateu (2010) *From satellite-framed Latin to verb-framed Romance: A syntactic approach.* Universitat Autónoma de Barcelona. Departament de Filología Catalana.

Adger, D. (2008) *A Minimalist Theory of Feature Structure*. lingBuzz/000583

(2011) *Labels and Structures*. lingBuzz /001252

Adger, D. & P. Sevenoius (2010) *Features in Minimalist Syntax*. lingBuzz/000825

Boeckx, C. (2009) *The Nature of Merge*. *Consequences for Language, Mind and Biology*. In Piatelli Palmarini et. al. "Of Minds and Language". Oxford, OUP.

(2010) *Defeating Lexicocentrism*. lingBuzz/001130

Borer, H. (2009) *Roots and Categories*. Handout presented at XIX Colloquium on Generative Grammar, University of the Basque Country.

Carston, R. (1998) *The Relationship between Generative Grammar and (Relevance-theoretic) Pragmatics*. University College, London.

Chomsky, N.:(1981) "Lectures on Government and Binding", Dordrecht, Foris.

(1995) "The Minimalist Program" Cambridge, Mass. MIT press.

(1998) *Minimalist Inquiries. The Framework.* MIT Occasional Papers in Linguistics 15.

(1999) *Derivation by Phase.* MIT Occasional Papers in Linguistics 18.

(2004) *Beyond Explanatory Adequacy*. En Belleti (ed.) "Structures and Beyond", Oxford, OUP.

De Belder, M. (2011) *Roots and Affixes: Eliminating Categories from Syntax*. PhD Thesis, Utrecht University.

De Belder, M. & J. Van Craenenbroeck (2011) *How to Merge a Root*. LingBuzz 001226.

Di Sciullo, A-M. & D. Isac, (2008) *The Asymmetry of Merge.* In Biolinguistics 2.4: 260–290

Embick, D. & R. Noyer (2004) *Distributed Morphology and the Syntax-Morphology Interface.* Draft: 25/10/2004

Escandell Vidal, M.V. (2006) "Introducción a la Pragmática". Barcelona, Ariel.

Escandell Vidal, M.V. & M. Leonetti (2000), *Categorías conceptuales y semántica procedimental.* In "Cien años de investigación semántica: de Michél Bréal a la actualidad" Tomo I, Madrid, Ediciones clásicas, 363-378.

Escandell Vidal, M.V & M. Leonetti (2011) *On the Rigidity of Procedural Meaning*, in Escandell Vidal, M.V, M. Leonetti & A. Ahern (eds.), (2011). "Procedural Meaning". Bingley: Emerald (Crispi Series)

Fábregas, A. (2005) *La definición de la categoría gramatical en una morfología orientada sintácticamente: nombres y adjetivos*. PhD Thesis, Universidad Autónoma de Madrid.

(2010) *An Argument for Phasal Spell-Out*. *Nordlyd 36*, *Special Issue on Nanosyntax*, ed. Peter Svenonius, Gillian Ramchand, Michal Starke, and Tarald Taraldsen, CASTL, Tromsø.

Grohmann, K. K. (2003) "Prolific Domains. On the Anti-Locality of Movement Dependencies". Amsterdam: John Benjamins.

(2004) *Prolific Domains in the Computational System*. In Actas de JEL 2004: Domains. Nantes: AAI, 211-216.

Hale, K. & J. Keyser (1993) *On Argument Structure and the Lexical Expression of Syntactic Relations.* In Hale & Keyser (1993) "The View from Building 20". Cambridge, Mass. MIT Press.

Halle, M. y Marantz, A. (1993) *Distributed Morphology and the Pieces of Inflection*, en Hale, K. y Kayser, J. (1993) The View from Building 20 Essays in Honor of Sylvain Bromberger, Cambridge, Mass.: MIT press.

Harley, H. & R. Noyer(1999) *State-of-the-Article: Distributed Morphology*. In GLOT 4.4. April, 1999.

Heisenberg, W. (1999) "Physics and Philosophy", New York: Prometheus Books

Hendrick, R. (2003) "Minimalist Syntax". Oxford, Blackwell.

Krivochen, D. (2010a) *Referencialidad y Definitud en D. Un análisis desde la convergencia entre el Programa Minimalista y la Teoría de la Relevancia.* Submitted to RSEL.

(2010b) *Algunas Notas sobre Fases*. UNLP.

(2011a) *An Introduction to Radical Minimalism I: on Merge and Transfer*. lingBuzz/001211

(2011b) *An Introduction to Radical Minimalism II: Internal Merge Beyond Explanatory Adequacy*. lingBuzz/001256

(2011c) *Unified Syntax*. Ms. UNLP.

(2011d) *The Quantum Human Computer Hypothesis and Radical Minimalism: A Brief Introduction to Quantum Linguistics*. Submitted to IJLS.

(2011e) *The Syntax of Spanish Relational Adjectives*. Ms. UNLP.

Leonetti, M. y M. V. Escandell Vidal (2004) *Semántica conceptual, semántica procedimental*, en Actas del V congreso de Lingüística General, Madrid, Arco.

Marantz, A. (1997) *No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of Your Own Lexicon*. En A. Dimitriadis, L. Siegel, C. Surek-Clark, and A. Williams, eds., *Proceedings of the 21st Penn Linguistics Colloquium*, UPenn Working Papers in Linguistics, Philadelphia.

(2008) *Phases and Words*. Manuscript, MIT.

Mateu Fontanals, J. (2000a) *Universals of Semantic Construal for Lexical Syntactic Relations*. Universitat Autónoma de Barcelona. Departament de Filología Catalana.

(2000b) *Why Can't We Wipe the Slate Clean?*. Universitat Autónoma de Barcelona. Departament de Filología Catalana.

Mateu Fontanals, J. (2000a) *Universals of Semantic Construal for Lexical Syntactic Relations*. Universitat Autónoma de Barcelona. Departament de Filología Catalana.

(2000b) *Why Can't We Wipe the Slate Clean?*. Universitat Autónoma de Barcelona. Departament de Filología Catalana.

Putnam, M. (Ed.) (2010) "Exploring Crash-Proof Grammars". Amsterdam, John Benjamins.

Sperber, D. y D. Wilson (1986a) *Sobre la definición de Relevancia*. En Valdés Villanueva, Luis Ml. (Comp.) (1991) En búsqueda del significado. Madrid, Tecnos.

(1986b/1995) "Relevance: Communication and Cognition". Oxford. Blackwell.

Uriagereka, J. (1998) "Pies y Cabeza". Madrid, Visor.

(1999) *Multiple Spell-Out.* In N. Hornstein & S. Epstein (eds.), "Working Minimalism", Cambdridge (Mass.), MIT Press, 251-282.

(2002) *Multiple Spell-Out*. In Uriagereka, ed. "Derivations: Exploring the Dynamics of Syntax". London, Routledge.

Wilson, D. y Sperber, D. (2003) *La teoría de la Relevancia*, en Revista de Investigación Lingüística, Vol. VII-2004. Págs. 237-286.

Wurmbrand, S. (2011) *Reverse Agree*. Ms. University of Connecticut.

Yus, F. (2010) *Relevance Theory*. In: "The Oxford Handbook of Linguistic Analysis". Eds. B. Heine and H. Narrog. Oxford: Oxford University Press, 679-701.

Zeijlstra, H. (2010) *There is only one way to agree*. Wroclaw, Poland.