

Towards an Ontological Theory of Language: Radical Minimalism, Memetic Linguistics and Linguistic Engineering, Prolegomena

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Abstract

In contrast to what has happened in other sciences, the establishment of what is the study object of linguistics as an autonomous discipline has not been resolved yet. Ranging from external explanations of language as a system (Saussure 1916), the existence of a mental innate language capacity or UG (Chomsky 1965, 1981, 1995), the cognitive complexity of the mental language capacity and the acquisition of languages in use (Langacker 1987, 1991, 2008; Croft & Cruse 2004; Evans & Levinson 2009) most, if not all, theoretical approaches have provided explanations that somehow isolated our discipline from developments in other major sciences, such as physics and evolutionary biology. In the present article I will present some of the basic issues regarding the current debate in the discipline, in order to identify some problems regarding the modern assumptions on language. Furthermore, a new proposal on how to approach linguistic phenomena will be given, regarding what I call «the main three» basic problems our discipline has to face ulteriorly. Finally, some preliminary ideas on a new paradigm of Linguistics which tries to answer these three basic problems will be presented, mainly based in the recently-born formal theory called Radical Minimalism (Krivochen 2011a, 2011b) and what I dub Memetic Linguistics and Linguistic Engineering.

Keywords: Linguistic Theory, Memetics, Radical Minimalism, Linguistic Engineering, Universal Grammar, Language Change.

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ποταμοῖσι τοῖσιν αὐτοῖσιν ἐμβίνουσιν, ἕτερα καὶ ἕτερα ὕδατα ἐπιρρεῖ.
 «Ever-newer waters flow on those who step into the same rivers.»
 Heraclitus

1 The ideas of Evans & Levinson (2009)

According to [Evans & Levinson \(2009\)](#), «we are the only known species whose communication system varies fundamentally in both form and content» ([Evans & Levinson 2009](#), 431). The former can be attested in the world languages. Just crossing the border by bike from one European country like the Netherlands to another one like Germany would surprise any foreigner amazed by the difference of both languages and their lexicon. The latter, which can be mostly exemplified by meaning can be attested when different types of constructions can be used to convey similar meanings in one language, like causative prefixes and periphrasis in Shawi to convey causation ([Rojas-Berscia 2013](#)), or nominalisations to convey possession in Mandarin Chinese ([Rojas-Berscia in prep.](#)). This is fairly true, and it could be assumed that any Martian linguist landing in the Earth would be surprised by this fact if he/she had the necessary equipment.

The article presented by Evans & Levinson stirred up different reactions from the Chomskyan corner and from functionalist views. The main claim by both authors was that «there are vanishingly few universals of language in the direct sense that all languages exhibit them» ([Evans & Levinson 2009](#), 429). According to the authors, linguistic universals such as Greenberg's unconditional absolute universals are improbable to exist. A claim that more or less states this as its insignia is the Chomskyan UG, for which there are no languages that do not exhibit the property of recursion, commonly known as the property of «embedding a constituent structure in a constituent of the same type» ([Pinker & Jackendoff 2005](#), 211), or in a Lindenmayer grammar-fashion, «a recursive rule is one which has the property of self-embedding, that is, in which the same phrase type appears on both sides of a phrase structure rewrite rule» ([Fitch 2010](#), 79). One of the first linguists to argue against this universal was Daniel Everett with his claim that the Pirahã language spoken in the Amazon lacked this type of embedding; the debate remains open though¹ (cf. [Everett 2005, 2007, 2009, 2010; Rojas-Berscia 2011](#)).

¹ Although in recent years Generative Grammar (GG) has received many attacks from different sides of the field, it must be credited that this theory was the only one in its origins which posited linguistics in more general debates within sciences.

There are ca. 7000 languages in the world and much more fieldwork is still needed to describe all of them; however, by the actual state of the art in which many typological and descriptive works have been carried out, it is hard to continue assuming that linguistic universals exist. Certainly, there are similar patterns across languages (Evans & Levinson 2009, 434); nevertheless, no claim that relates these tendencies to other disciplines has been proposed (§ 3.2). As can be inferred from the article, from the current state of the art it can be assumed that there are no sound universals, no syllable structure universals, no morphological universals, no universal word-classes, no syntactic universals, no semantic universals, but just tendencies. The only thing that can be said to be universal, however, and following the authors, is that «the human language processing system is a **hybrid**: “a biological system tuned to a specific linguistic system, itself a cultural historical product”» (Evans & Levinson 2009, 446). The problem with this definition, although clearly stated and superior to previous functionalist ones that argue for language to be something to perform something, is the word «hybrid», since there is no clear relation between the biological nature of language and the cultural one. Why should it be called a hybrid if they are just tuned? Is language inside and outside of the mind at the same time? Previous definitions of language such as the generative one, as in the Principles and Parameters Theory, which argued for a universal grammar based on language properties retrievable from the existent languages, specifically English, or usage-based approaches which argued for cognitive systems to be tuned to an infinite set of language structures forged by use, were only based on what could be seen in the «form» of the existent languages, rather than by the nature of language itself. This tradition can also be somehow perceived in the authors' definition. This tradition is the base of what I call Morphological Linguistics.

In the following paragraphs I will present a view against this hybrid definition and this form-based or morphological definition of language, arguing for two different systems of interplay, a bio-physical one and several memetic ones.

2 The debate of the century

Since Linguistics was born as a western discipline, many, if not all, of its assumptions were derived from the classical views of Plato and Aristotle, giving rise to the line-up of the two leading schools in the discipline: formalism and functionalism. While the formalist school is based on a rationalist philosophy, following Socrates, Plato and modern philosophers such as Descartes, Leibniz and Spinoza, and arguing for innate ideas or inborn universal knowledge in the form of a UG (Chomsky 1965), the functional school is based in an empiricist philosophy, following Aristotle and the modern philosophers Bacon, Hume, and Locke, arguing for knowledge acquired through sensory-motor experience, an issue that was conceptualised in recent usage-based models (Croft & Cruse 2004; Tuggy in prep.), and in the existence of a *tabula rasa* or, in my terms, a

blank slate before any type of learning. Hereby I present a table with some basic assumptions in both schools:

TABLE 1: *Functionalism vs. Formalism, assumptions and methodology (based on Shibatani 2012)*

| | Functionalism | Formalism |
|--------------------|--|--|
| Assumptions | Language ability part of a general cognitive apparatus | Inborn unique language faculty (Universal Grammar) |
| | Embedded in cognitive socio-cultural context | Language autonomy |
| | Linguistic structures functionally motivated and shaped by use | Independent of use and function |
| Methodology | Inductive method (larger samples) | Deductive methods (fewer language samples) |
| | Avoid abstract theoretical constructs | Posit abstract theoretical constructs |

Nowadays, many different theories coexist which belong to one of these two sides of the coin. Hereby I present a chart with some of the most known functional and formal theories of language:

TABLE 2: *Today's schools of linguistics (based on Shibatani 2012)*

| Functional schools (Greenbergian typology) | Formal schools (Generative Grammars) |
|---|---|
| Functional typology (T. Givón, B. Comrie, William Croft, John Haiman, Joan Bybee) | Principles & Parameters, Government & Binding (Chomsky) |
| Discourse studies (T. van Dijk, S. Thompson, P. Hopper, J. DuBois) | Minimalist Program (Chomsky) |
| Cognitive Grammar/Linguistics (R. Langacker, L. Talmy, George Lakoff) | Lexical-functional grammar (Joan Bresnan) |
| Systemic functional grammar (Michael Halliday) | Generalized Phrase Structure Grammar (Ivan Sag) |
| Functional grammar (Simon Dik) | Relational grammar (David Perlmutter) |
| Susumu Kuno's functional grammar | Conceptual semantics (Ray Jackendoff) / Simpler Syntax (Culicover & Jackendoff) |
| Construction Grammar (C. Fillmore P. Kay, A. Goldberg) | Nanosyntax (Starke) |
| Role and Reference Grammar (R. Van Valin, William Foley) | Optimality Theory (Prince & Smolensky) |
| Descriptive-typological grammar, aka «Basic Linguistic Theory» (R.W.M. Dixon) | Head Driven Phrase Structure Grammar (Pollard & Sag) |

Most of the models in the functionalist schools assume that the language system emerges from usage, i.e. the formal embodiment of natural languages is learnt to convey specific functions which are language-dependent. The formal theories of language, almost all derived from the generativist model, could all agree in arguing that language is «a set (finite or infinite) of sentences, each finite in length and constructed out of a finite set of elements» (Chomsky 1957, 13). Although it might sound unfair to reduce all the formal accounts of grammar to this classical statement, this is partially what has been done in the last sixty years. Many improvements to the UG theory have been developed, though no one remarked, including the functionalist approaches, that language was defined in terms of the form of natural languages. It is true that languages have sentences, words, morphemes, sounds, etc. However, trying to define language based on what these constituents do will turn out to provide a Morphological Theory of language, a theory of how language, or UG if assumed, looks, but not what it is.

The main aim of this first statement of the theory is to provide a new perspective in the debate; however, it is hard to provide any new improvements to such a group of theories. What I propose is, against the former theoretical approaches, an Ontological Theory of Language, which means defining first what the nature of language is, rather than defining it by what can be seen in natural languages. If I group all the former accounts, I can almost unmistakably affirm that they are all Morphological theories of language. It is true that all these theories have provided linguists with important tools for language description and theoretical thinking; nevertheless, if there is no Ontological explanation of the nature of language, it is hard to make our own approaches dialogue with what has been developed in sciences such as physics or evolutionary biology.

Adopting the ontological perspective, the only thing that can be said about language and languages is that they exist. Explanations such as «languages change», «languages are socio-culturally relevant», «language information is stored in the mind», «languages are processed by a complex cognitive system», all derived from Morphological accounts of language, do not account for the nature of language but for its behaviour. Although this might sound fairly simple, it is a very powerful statement. If language and languages exist, they have to be governed as all existent things in the universe, thus they are physical, but, how to account for that? This is what I call the Heraclitus Problem. Heraclitus was a pre-Socratic Greek philosopher from the VI century BC. According to him, the universe was constantly and steadily changing. This idea was repeatedly inferred from one of the cryptic statements of the thinker: «ποταμοῖσι τοῖσιν αὐτοῖσιν ἐμβαίνουσιν, ἕτερα καὶ ἕτερα ὕδατα ἐπιρρεῖ», in English, 'Ever-newer waters flow on those who step into the same rivers.' If any of us go to the Rhine coast in Cologne, the Rhine River will always be conceptually the same; however, if one steps into it one can undoubtedly infer that the water she is feeling in her feet is not the same she felt some years ago in the same place. This idea is very powerful because language is the same. Language is basically the same for all humans; languages, howbeit, flow, change: they could be considered the water that flows in «language». Language is apparently always the

same, but what flows in it is constantly changing. Language itself is not static though. It can change as well; however, its changes are not as perceivable as the immediate changes attestable across different languages. This is what I call Heraclitean linguistics.

Taking these ideas into account, a new Ontological/Heraclitean theory of language has to ulteriorly answer what I have named «the main three» problems of linguistics:

1. What is language?
 - 1.1 What is language used for?
2. What are languages?
 - 2.1 What are languages used for?
3. What is the interaction between language and languages?

If language and languages exist, what are they? This is the basic question an ontological theory of language has to answer. At the moment, leaving apart morphological theories of language, there haven't been accounts on that apart from Krivochen (2011a, 2011b). Above I have added some subquestions regarding the function of language and languages. These subquestions are constantly being tackled by other disciplines such as Philosophy of the Mind, Philosophy of language, Psycholinguistics, for 1.1, and Sociolinguistics, Discourse Analysis, Ethnolinguistics, Anthropological Linguistics, etc., for 2.1. In the following section, three ontological theories which face the three basic problems will be introduced.

3 Towards a new Linguistics

3.1 Radical Minimalism (Krivochen 2011a, 2011b)

What is language? The main aim of this theory is «to integrate the study of language (along with the study of any other mental faculty) into the study of the physical universe (or «natural world»), as a physical system among many others with which language should optimally share characteristics, operations and principles that we take to be universal» (Krivochen 2011a). Hence, if language is part of the universe, i.e. the natural world, it has to be a physical. The basic tenets of the theory which answer to one of the main three ontological problems in the discipline can be summarised as follows:

1. Language is a physical system; hence, part of the natural world.
2. If 1 is assumed, the same principles applied to other physical systems can be applied to language, since it shares basic properties with them.

3. Operations in language can 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 (Krivochen 2011b, 36).

Moreover, 2 and 3 can be summarised in what Krivochen has called the Strong Radically Minimalist Thesis (SRMT) which states as follows:

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.²

(Krivochen 2011b, 2)

This system, physical in its nature, which exists only in human beings, is what I call Human Language Computational System (HLCS). Since all biological beings must have some kind of LCS, the existence of a HLCS must have occurred phylogenetically and following the principles of natural selection. This HLCS is used for all cognitive processes, just like computers use binary coding to process software.³ The primary operation behind the HLCS is called concatenation, and it can be described as follows:

[Concatenation]⁴ is a **free unbounded operation** that applies to **two** (smallest non-trivial number of elements) distinct objects sharing format, either ontological or structural. [Concatenation] is, on the simplest assumptions, the **only generative operation in the physical world**.

(Krivochen 2011c)

Concatenation can be said to be the operation behind the HLCS. The way in which it «operates», especially dealing with languages, remains pendant and is one of the most important objectives of future research in this field.

3.2 Memetic Linguistics, first ideas

What are languages? From an ontological point of view, if languages exist, they have to be physical; hence, governed by the principles of natural selection as any other thing in the universe. This definition might sound awkward, since

²For more information on the physical principles behind, cf. Krivochen 2011a.

³Languages, in this fashion, would be decoded by the HLCS as a computer does the same to software. However, languages tend to have a clear importance in cognition as well. This importance remains to be studied. As a speculation I would argue that languages are to brains what operative systems are to computers.

⁴Though originally called *Merge* by the author (following Boeckx 2010) and then changed to concatenation, there is a great difference between the Chomskyan *Merge* and the Krivochean one (cf. Krivochen 2011c, 42).

languages cannot be considered something inherently biological or tangible. This point of view, however, changed in the 70's with the appearance of «The Selfish Gene» (Dawkins 1976) work which argued for the existence of units of cultural transmission called *memes*. Memes, just like genes, are replicators which human beings produce and transmit through the process of imitation, and «are in competition to get copied [so that] the successful ones will be those of high fidelity, high fecundity, and longevity» (Blackmore 1999, 104). Imitation is not thought, however, as what a folk theoretical framework might suggest, as the mere copying of information from one source to another. Imitation relies on a more complex process, in which information replicated is processed by one capable individual and complexified by him/her/it, giving rise to a different complex form, almost equal to the first one but with a slight change. These new complex forms will start competing with the previous forms in the process of natural selection. For natural selection to exist, three conditions have to be assumed:

1. Variation, in the sense something new was introduced to something already existent;
2. Heredity or replication, in the sense of a capacity of copying elements exists;
3. Differential «fitness», in the sense of an element is more or less suited than another one in a given environment.

In the case of genes/memes this is what happens. In the case of languages, it can be undoubtedly said that the process occurs steadily and frequently. Many of these cases have been discussed in the last two hundred years by the discipline so-called Historical Linguistics. Although this faction of linguistics has only been interested in the processes behind language change and its universality, there is a great resemblance between what they describe and what can be called meme natural selection.⁵ For instance, in the case of Late Classical Latin, a future tense formalisation with two forms could be attested:

- (1) cantabo
'I will sing' (synthetic form)
- (2) cantare habeo
'I will sing' (periphrastic form)

According to historical linguists, synthetic forms tend to be lost when new periphrastic ones appear. This is exactly what happened in the language: (1) was lost. Later on, when the Neo-Latin languages emerged, this form started to become more analytic, while a new periphrastic one appeared:

⁵It must be said, however, that Historical Linguistics was indeed born in such a path, following the positivist idea of the genealogical trees of languages. Although such a radical view is nowadays left apart for more continuous change paradigms, the idea remains more or less the same and could be perfectly extrapolated to what I call Memetic Linguistics.

- (3) cantar he >> cantaré
'I will sing'
- (4) voy a cantar
'I will sing'

It can be easily heard among Modern Spanish speakers the preference for (4), giving some strength to the theory of periphrastic preference as a universal. However, this does not apply thoroughly across languages. A great exception can be attested in Modern English possessive constructions,

- (5) John's dog (analytic)
- (6) The dog of John (periphrastic)

where (5) is preferred over (6). There are many reasons for it to happen and sociolinguists may have very interesting explanations; however, from an external point of view, what I can see is that languages, memetic in their nature,⁶ and similar to genes, manifest change in the way of natural selection, where language change cannot be said to be composed of universal rules of language change, but by **memetic tendencies**. This can also be applied to typological universals, in which several traits can be tracked within different places, arguing for the existence of the so called «areas». These areas are nothing but waves of meme-expansion and are of great interest to Memetic Linguistics. Future research should be focused on the tracking of memes in the languages of the world from two perspectives that I state as follows:

1. **A micro-memetic perspective:** Interested in how new replicators expand in languages in a small-scale (the former field of Sociolinguistics).
2. **A macro-memetic perspective:** Interested in how strong replicators continue their expansions on a large-scale⁷ (the former field of Historical Linguistics & Typology).

This research has to be done taking into account that one language, for instance Wanka Quechua, is not a meme in its own right, but a group of different memes in a sort of cooperation, also called *memplex* (Blackmore 1999). In this sense, all phonetic, phonological, morphological, syntactic, semantic and pragmatic components of a given language will compete in natural selection **cooperatively**, within the same system, and **individually** within systems.

Assuming that languages are physical, thus memetic, in its nature and processed by biological machines with an adapted LCS (only humans in this case), the second question is answered from an ontological perspective. Recapping what Evans & Levinson (2009) said about language to be: «the human language

⁶This view was also explored by Croft (2000), with what he dubs linguemes.

⁷Recursion, for instance, could be an extremely strong memetic linguistic replicator, even driving linguists to write whole theories about it. An exception to the expansion of recursion would be the Pirahã language spoken in the Brazilian Amazonia (Everett 2005; Rojas-Berscia 2011).

processing system is a **hybrid**: “a biological system tuned to a specific linguistic system, itself a cultural historical product”» (Evans & Levinson 2009, 446), the «hybrid» hypothesis turns out to be inconsistent. Language is a hybrid by no means, but two different things: an HLCS with biological grounding⁸ and different memetic systems in an uninterrupted and visible competition process within natural selection. What is true, however, is that they are constantly interacting and some features of one have to be compatible with some features of the other in order to achieve «reading».

However, how do the HLCS and the world languages interact? What’s this interface?

3.3 Linguistic Engineering, an open field

What is the interaction between the HLCS and the language memplexes? Since languages, as well as music or mathematics, were invented by humans with a brain with a HLCS, they have to be adapted to it, i.e. be compatible, as an operative system is compatible to PCs with specific features. A 1993 PC would not be able to read Windows’ modern versions. All languages then have to be specifically designed for its compatibility with the basic property of the HLCS, concatenation and subproperties. This can be considered a language universal and it can be undoubtedly said that all languages will exhibit it.

The way in which specific human languages and the HLCS interact is a field that remains to be studied in the following decades in what I call Linguistic Engineering. Many attempts have already been made in order to achieve such research from the Morphological corner of the discipline, mainly by Optimality Theory and the incremental reading hypothesis (Prince & Smolensky 2002), and Neuroscientists in general. Deeper studies in how the HLCS process different memes and how this difference triggers cognition, as well as how do languages adapt to the HLCS remain to be done. Moreover, more cross-species studies should be done in order to account for the specificity of memetic language emergence in human beings. It has been attested that primates exposed to memetic languages tend to process lexicon of it and very small constructions (Tomasello 2010). It may be in this difference with the HLCS in memetic language processing the answer for the phylogenetic development of it in humans. The question anyway remains open, since there is much to do nowadays.

4 Final remarks

In brief, the basic ideas of the paradigm are the following:

1. Former theories of language, both formal and functional (§ 2), proposed a model of language based on the morphology of actual languages, i.e.

⁸If one assumes that the HLCS is physical, it must undergo the process of natural selection as well. This is indeed what happens. The phylogenetic origins of the HLCS have been somehow traced by Tomasello (2010), arguing for the pantomiming and gestural origin of human language.

Morphological linguistics, not answering the question of the nature of language itself.

2. A theory of language must account for the ontology of language and languages, i.e. Ontological Linguistics. Following this reasoning, the only thing that can be said about the HLCS and languages is that they exist: they are physical.
3. A theory of language has to answer to «the main three». The theories aiming at this are RM, Memetic Linguistics and Linguistic Engineering.
4. The basic property of the HLCS is one, concatenation. The morphology/characteristics of languages are extremely diverse. Since they are memeplexes, this diversity is exemplified by memetic tendencies.
5. Within Memetic Linguistics, I defined two perspectives: the micro-memetic and the macro-memetic. The former focused on small-scale memetic linguistic processes and the latter focused on large-scale memetic linguistic processes.
6. All languages have to adapt to their unique processor, the HLCS. How this occurs is a future task for Linguistic Engineering.
7. Finally, *pace* Evans & Levinson (2009), language is not a *hybrid* (biological + cultural). We are dealing with two different things / two levels of analysis: a physical HLCS system and several physical memetic systems (languages), both driven by natural selection biologically and culturally, respectively.

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