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THE WORD LANGUAGE IN THE BIOLINGUISTIC SUBFIELD:
A Qualitative Study-Case of Conceptual Metaphors in the Register of One Author

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This is a qualitative study on the conceptual manifestation of the concept language in two academic texts from an author whose area of research is the biolinguistic subfield of linguistics. The main objective is to illustrate the domain in which the lexical concept mentioned above exists. The theoretical framework which supports this thesis is based on the theory relative to conceptual (or cognitive) metaphor theory, one of the major constructs which make up the cognitive-linguistic enterprise.

At the same time, and as a parallel argumentation, it is introduced the discussion regarding the status of linguistics as a science and the need to study its most important concepts systematically, by means of a subfield entirely dedicated to do this: *metalinguistics*, or the linguistic study of the discourse of the linguists.

In memory of Carlos Zenteno Bustamante.

"The human understanding is like a false mirror, which, receiving rays irregularly, distorts and discolors the nature of things by mingling its own nature with it.".

Francis Bacon

The New Organon

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CHAPTER ONE: INTRODUCTION

This is a qualitative study on the concept LANGUAGE. Specifically, about its manifestation in the register of a linguist whose area of research pertains to the biolinguistic approach. The main corpus studied includes all the phrases and some clauses in which the word language appears in two academic papers of the same author.

The objective of this thesis is to study the cognitive metaphors in which the lexical concept LANGUAGE emerges. In 1980, Lakoff and Johnson attested two linguistic assumptions. First, the claim that concepts are metaphorical in nature and, second, that they can be studied following the theory and definitions relative to conceptual metaphor theory.

The working hypothesis of this study is that "[o]ur ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature " (Lakoff and Johnson, 2003, p. 4). Specifically, that the conceptualization of abstract concepts is made by recurrent subjective mappings between at least two different conceptual

domains, an abstract and a concrete one. (Lakoff and Johnson, 1980; 2003).

In the subfield of cognitive linguistics, it is generally acknowledged that the nature of concepts is closely related to our on-going experience (Evans, 2011) and specific domains of activity, such as those related to the concrete or abstract experiences (Zinken, 2013). Concepts also change along our lives (Evans, 2014) and according to the work on grammaticalization by Hopper and Closs (1994), they also change along long periods of time. At their core, they posses atomistic uniqueness (c.f. schema, in Fillmore, 1975), and combine to provide frames of experiences and specific perspectives (Fillmore, 1975).

At the discourse level, there seems to exist an ecology of relations between the words that refer to the concrete aspects of life (such as up, down, road, war) and those which refer to the abstract ones (for example love, time, confidence). In this system, abstract concepts are always explained in terms of specific aspects of our concrete domain of experience (Lakoff and Johnson, 1980).

If metaphors are defined as a conceptual process of mapping specific characteristics between entities which belong to different domains of

experience, concepts, then, are metaphorical in nature (Lakoff and Johnson, 1980). In simpler terms, we cannot think, imagine or talk about abstract entities unless we use words that refer directly to the concrete aspects of our daily life and culture.

It follows then, that the conceptualization system of linguists also makes sense of abstract concepts by means of conceptual metaphor processing. That is, subconscious conceptual parallels from domains related to our bodily or ordinary cultural experience to make sense of the abstract aspects of life. Then, if the word language refers to an abstract rather than a concrete entity, then the emergence of the lexeme language will necessarily need a context with words related to the concrete aspects of our experience of the concept LANGUAGE.

From a cognitive linguistic approach, concepts can be observed systematically along the paradigm of research started by Lakoff and Johnson (1980) and their seminal work on conceptual metaphors. According to the authors, conceptual metaphors share the salient characteristic that their core semantic material behaves systematically and therefore it is predictable. For example, every time a person uses the

conceptual metaphor LOVE IS A ROAD, the mappings will link the same lexical units at the phrase level in order to highlight the same specific aspect of the abstract concept at a context, as in "our *relationship* is at a *crossroads*"; "look *how far we have come*" (Lakoff and Johnson, 2003).

The second working hypothesis that governs this study is that the word language refers to an abstract rather than a concrete entity, and, as such, it will be manifested by different conceptual metaphors in the textual level. Each of these metaphors being constituted by different patterns of words at the phrase or clause level, where the words that provide context to the abstract lexical concept form part of the concrete domain. Hence, this thesis is an attempt to systematically depict and study the conceptual metaphors in which the lexeme language inheres.

The concept language was chosen because it constitutes the object of study of linguistics and up to now it has not been studied by current cognitive metaphor theory. What is more, even though the theory predicts different conceptual and linguistic manifestations of abstract concepts in discourse, the discourse of linguistics (that is, the constituting concepts of it) has not been systematically studied by current cognitive linguistic

research. It is argued that this lack of research may lead to the false assumption that the concepts used in linguistics by the different authors may correspond to the same entity, when they may just highlight different parts of it in agreement with the cognitive metaphors used to refer to them. Thus, there exists the possibility that the same object (i.e. data) can be interpreted differently because different conceptual metaphors highlight different aspects of the data being observed. Consider, as example, the experience narrated by Mater (2004) in the last session of a conference on conceptual knowledge attended by psychologists, anthropologists, neuropsychologists, and neurobiologists, where "the participants were asked to define what they meant by conceptual knowledge. [...] There were roughly as many opinions about how to define conception, perception, and their relationships as there were speakers." Mater (2004: viii).

Regarding the key term metalanguage, it has been used before, but with a different purpose: that of describing the language people use to talk about their language, the language other people use, or to refer to the reflexive property of language and its own metalanguage (Gonzáles and Loureda, 2002). It can be appreciated in all the words and phrases that

"predican algo del lenguaje o del hablar" (Loureda, 2009. p. 318). In this paradigm, he observes a continuum which wanders from the primary language as in "te veo" up to statements as "'veo' viene de 'video'" or metalanguage as such (Loureda, 2009. p. 318). The author recognizes three types of metalanguage: The metalanguage of universal level ("language", "semantics", "metonymy"), the metalanguage of the idiomatic level (which pertains to the field of phraseology) and the metalanguage of the speech (Loureda, 2009, pp. 322- 327). The difference between theses studies of metalanguage and the proposal for a subfield of linguistics called *metalinguistics* lies in that it is argued that metalinguistics should focus on understanding and projecting the way in which the definitions and procedures that specialists of language use diverge and converge in relation to the object of study.

The purpose of this thesis, then, is twofold. First, it is an attempt to show how one of the most basic concepts of linguistics is conceptualized in the domain of a linguist who writes from the biolinguistic perspective. Second, this is an attempt to start the serious endeavour of studying the language linguists use (i.e. metalinguistics) on a systematic basis, using this

specific cognitive approach to study language.

The three constructs that make up the theoretical frame that supports this thesis are: first, the procedure to detect conceptual metaphors from linguistic data (Chapter III: Methodology), second, the definitions to sort them by type (Chapter II: Theoretical Framework) and third, the system to name them (Chapter III: Methodology).

As a summary, this is a qualitative study about the way in which the word language is conceptualized by a linguist in the context of the biolinguistic subfield of linguistics.

The next chapter, Chapter Two: Theoretical Framework, first introduces the paradigm of cognitive linguistics and the part cognitive metaphor theory plays in it. By no means it constitutes an exhaustive review of the scientific literature. It just tries to provide a consensual context regarding the key events which contributed to the development of the subfield and the way in which conceptual metaphor theory is embedded in the cognitive-linguistic enterprise. Right after that, it is assumed as a starting point for modern cognitive metaphor theory the work made by Reddy (1979). Here it is also assumed a radical subjectivist stand as

explained by the toolmakers paradigm introduced by him. Next to that, it is explained the model made by Lakoff and Johnson (1980; 2003) and the main definitions and examples to sort the data of this study by type. It is very important to keep in mind that this thesis only uses the categories proposed by Lakoff and Johnson (1980, 2003) to sort the information by type. Nonetheless, in Chapter Five: Discussion, a contrast is made between the canon or Lakoffian perspective, the method introduced here to select the data, the results and current research.

Finally, other observations on the phenomenon are shown with the aim of expanding the discussion regarding the theoretical issues around cognitive metaphor theory, specifically, about the types as introduced by the canon and the observation of the process taking place at two different levels (the discursive and the textual). Thus, the topic of types and categories is very important in order to understand the way in which the data shown here have been sorted and how, according to other views, it can be interpreted differently (Chapter Five: Discussion).

Chapter Three: Methodology unveils the method which was invented in order to bridge the gap existing between detecting a linguistic cue (be it a

word, phrase, clause or sentence) and inferring a conceptual metaphor (always written in capital letters) out of the immediate context in which it appears. One of the big questions relative to this issue regards the definitions used to make a distinction between the literal use of a lexeme and a non-literal one. Up to date, there is no absolute answer about it and the methods to do both, detect them and name them begin at the subjective unidirectional criteria of the specialist up to very complex systems in which a propositional-logical analysis stands as a must in order to check the metaphorical value of a word or phrase. Here is proposed a model which blends a formal presupposition ("as the lexeme language refers to an abstraction its use is likely to be metaphorical") manual procedures and formal definitions to do both, choosing the context in which the lexeme under inquiry seems to be used metaphorically and naming the metaphors.

Chapter Four: Results constitutes a dialogue between the goal of this thesis (that of depicting the way in which the concept LANGUAGE manifests in the language of a linguist), the theory as presented here and the actual behavior of the phenomenon. This process is supported by figures, diagrams and prototypical examples taken from the texts studied. The aim

behind presenting the diagrams and numbers is that of showing the general behavior of the phenomena and as an aid to interpret (or re-interpret) the data in Chapter Five: Discussion. Nevertheless, the first three appendices show the process and actual data which supports the numbers, diagrams and graphics presented there as evidence.

Then, Chapter Five: Discussion, as stated in the prior paragraphs and above, interprets the results in agreement with the intended goal of this study, the paradigm of Lakoff and Johnson (1980; 2003) and the discussion relative to the different levels (textual/conceptual) in which the phenomenon seems to occur.

Finally, Chapter Six: Conclusion shows, first of all, the implications of the results for the theoretical issues as presented here, the limits of the research, and tackles down, for the last time, the drawbacks, possible improvements and implications relative to the idea of this new proposed sub-discipline of linguistics, metalinguistics.

CHAPTER TWO: THEORETICAL FRAMEWORK

This thesis pertains to the sub-field known as cognitive linguistics. Particularly, it uses the findings of Lakoff and Johnson (1980) on the metaphoric nature of concepts and conceptualization to support the main assumptions and arguments introduced here.

The working hypothesis held in this thesis is that the word language refers to an abstract rather than a concrete kind of entity. Thus, when referring to the concept LANGUAGE, mappings from at least one other different (concrete) conceptual domain must take place. The central issue of this study is to observe the cognitive metaphors in which the word language is present.

The section immediately bellow introduces a broad depiction of cognitive linguistics. Right after that from 2.1.2 up to 2.1.3 the important topic related to the concept of concept is developed. Then, 2.2 provides a summary on the origins and development of conceptual metaphor theory. It

also delivers the definitions to do both, sorting the metaphors by type and discussing the results. Next to that, 2.3 shows a review on the existing models to dissect cognitive metaphors from linguistic data. Finally, to close this chapter, it is held a brief discussion regarding the gaps on the theory which justify this study.

2.1 Cognitive linguistics

2.1.1 Main aim and beginnings

The aim of cognitive linguistics (from now on CL) is to observe the way in which language is linked to the rest of our cognitive faculties (Dirven, 2005; Evans & Green, 2006; Evans, 2007). In words of Evans, it "is an enterprise or an approach to the study of language and the mind rather than a single articulated theoretical framework " (Evans, 2007, p. 32). Therefore, the theme of concepts and conceptualization processes forms part of the basal issues for the development of linguistic theories linked to human cognition.

Its beginning is rooted in cognitive psychology, specifically, in gestalt psychology, the prototype theory inspired by the works of Rosch on

human categorization and philosophy (Dirven, 2005, p. 17). It also constitutes a response to the growing perception of the inadequacies of generative grammar to explain issues such as those related to the existence of lexical categories and processes of categorization (Evans & Green, 2006). A few decades before, the Chomskian revolution had channelled the work of linguists around the world towards the search of a language acquisition mechanism, the language acquisition device (LAD) in our brains. Therefore, the properties of categorization had been related to the application of a linguistic algorithm, leaving out of the equation the fact that our linguistic experience is actually embedded in a mind which is in contact with a cultural tradition. According to Rosch, "human categorization should not be considered the arbitrary product of historical accident or of whim but rather the result of psychological principles of categorization." (Rosch, 1978, p. 1). In words of Lee:

> In the generative model the structure of linguistic expressions is deemed to be determined by a formal rule system that is largely independent of meaning. By contrast cognitivists argue that linguistic structure is a direct reflex of cognition in the sense

> that a particular linguistic expression is associated with a particular way of conceptualising a given situation. (2005, p.1).

In contrast, in CL "language is assumed to reflect certain fundamental properties and design features of the human mind". (Evans & Green, 2006, p. 5). As Rosch explains, "[i]t should be emphasized that we are talking about a perceived world and not a metaphysical world without a knower." (Rosch et al. 1976, p. 382). The change is visible. The CL enterprise seeks to unveil the principles which blend together our experience with our perception of reality in language.

On the other hand, CL is not a theory but a label. In words of Evans and Green, CL stands as "an approach that has adopted a common set of guiding principles, assumptions and perspectives which have led to a diverse range of complementary, overlapping and sometimes competing theories." (Evans & Green, 2006, p. 3). This common scientific ground to start new explorations began to link together the will and interest of many researchers who found in CL "an approach to language that is based on our experience of the world and the way we perceive and conceptualize it." (Ungerer & Schmid, 1997, p. X). In that sense, "[c]ognitive linguists

believe that our shared experience of the world is also stored in our everyday language and can thus be gleaned from the way we express our ideas." (Ungerer & Schmid, 1997, p. XII).

At the beginning, the number of publishings were scarce. Nonetheless, the observations regarding how words activate specific schemas of perception by Talmy (1975), and the introduction of frame semantics by Fillmore (1975), boosted the spirits of the researches who called themselves 'cognitive linguists' (Evans & Green, 2006, p. 3). Then, according to Dirven (2005) once the study on conceptual metaphors by Lakoff and Johnson (1980) appeared, the road was paved to establish this new sub-field of linguistics on a solid basis. Finally, according to Evans and Green (2006) in 1989 the International Cognitive Linguistics Society was established, and a year after that the journal Cognitive Linguistics appeared, officially introducing this new sub-discipline to study language to the world.

Dirven (2005) thinks that today, it is a well known fact by the scientific community of language specialists that "CL approaches language

as an integrated part of human cognition which operates in interaction with and on the basis of the same principles as other cognitive faculties." (Dirven, 2005, p.17). Thus, CL can be thought of as an approach to study language "which analyzes language in its relation to other cognitive domains and faculties," (Ibíd.) such as memory, categorization, conceptualization, perception of time, emotion and many others.

Finally, the author identifies five major strands which have an ongoing growing work doing research and improvements within the CL subfield: a gestalt-psychology-based strand, a phenomenology-based strand, a cognitive discourse strand, a cognitive sociolinguistic strand and a psycholinguistic strand (Dirven, 2005). The linguist also recognizes an incipient work in "cognitive phonology, morphology, crosscultural semantics, typology, historical semantics [and] Applied Cognitive Semantics." (op. Cit. p. 18).

In short, CL seems to be one of the most influential sub-fields of studies that has been developed since the well known Chomskian revolution and the search for the language acquisition device.

In this thesis we share the same general principles that gave rise to the sub discipline. That is, the question about what kind of entities concepts are and how they manifest in our language forms part of the core theoretical issues of this study. Particularly, this study is framed within the phenomenology-based strand, specifically, along the embodied realism tradition (Dirven, 2005) started by Lakoff and Johnson (1980). At its core it assumes that language both, depicts and also shapes our perception of reality (Lakoff, 1990). One of the differences with other studies of this kind is that here we observe the behaviour of just one lexeme. Here it is assumed that our language both, depicts how our experience in the world gives meaning to words (being the word our basic conceptual unit) and how, at the same time, words shape our perception of reality.

2.1.2 Concepts and CL

2.1.2.1Common ground

Even though it seems that cognitive linguistics covers a very broad area of knowledge, there are some working principles in which the different views and diversity of the field conjoins. In words of Clausner and Croft

(1999) the fundamental theoretical construct among cognitive linguists (from the point of view of cognitive semantics) are that: (i) the basic semantic unit is a mental concept; (ii) concepts cannot be understood independent of the domain in which they are embedded; (iii) conceptual structures represent a construal of experience, that is, an active mental operation; and (iv) concept categories involve prototypes and are organized by (at least) taxonomic relations. (adapted from Clausner and Croft, 1999, p. 1).

In the next section we explore the notion of concept deeper (domain, image schema, frame, perspective an scene) in order to characterise the nature of concepts and how they can be observed. The importance of the definition of concept lies in that our view or consensual agreement on what kind of entity is a concept and how it can be studied will determine both, the methodology and the procedure by means of which the data will be sorted and discussed.

2.1.2.2 Concepts and image schemas.

According to Zalta, Margolis, and Laurence (2014, p. 1) , "[c]oncepts

are the constituents of thoughts" and play a central role in conceptual processes such as "categorization, inference, memory, learning, and decision-making.". Nonetheless, the nature of concepts and conceptual manifestation are still subjects of controversy and modern academic debate (Zalta *et al*., 2014).

In CL concepts and conceptualization have a central place too. Mainly, regarding the understanding of both, the processes by mean of which our mind works and the way in which our body-mind is connected to the world and the other senses (Gibbs, 2008, p. 4).

According to Evans (2007), concepts are "[t]he fundamental unit of knowledge central to categorisation and conceptualisation" (p. 4). They form the structure of our conceptual system and "from early in infancy are redescribed from perceptual experience through a process termed perceptual meaning analysis" (Evans, 2007, p. 31). In the end, this constant process of conceptual reanalysis produces a basic coherent unit of perception of reality named as image schema.

Image schemas constitute our basic pieces of knowledge that provide

us with the awareness that we have a body, an identity and a relation with the world (Fillmore, 1975). They derive "from our everyday interaction with and observation of the world around us." (Evans. 2007, p. 106). Think about the conceptual relation UP-DOWN we construe in our lives. In the end, this conceptualization will be closely related to our own bodily experience of it along time. It is also held that at the linguistic level they can be "encoded in a language specific format known as the lexical concept" (Evans, 2007, p. 31) and that though "they are relatively stable cognitive entities they are modified by ongoing episodic and recurrent experiences". (Ibíd).

2.1.2.3 Concept and domain.

Nonetheless, concepts are not sustained by their own in our mind. They actually exist within a very complex integrated series of basic mental representations (i.e. image schemas) which coexist in a coherent semiotic ecology with many other concepts and our accumulated everyday experience of the world. This coherent whole in which concepts coexist is known as domain. In words of Clausner and Croft (1999, p.2):

> concepts do not occur as isolated, atomic units in the mind, but can only be comprehended (by the speaker as well as by the analyst) in a context of presupposed, background knowledge structures. The most generic term for this background knowledge structure is domain.

Specifically, "a domain is a semantic structure that functions as the base for at least one concept profile." (Calusner & Croft, 1999, p. 6). In other words, at the moment we utter a word, not only the meaning associated to it activates, but also a series of other concepts that provide substance to the lexeme activates too.

In relation to conceptual metaphor theory, according to Evans (2007, p. 61) conceptual domains "are relatively complex knowledge structures which relate to coherent aspects of experience.". Think of the conceptual metaphor that includes mappings from our concrete experience relative to MONEY to talk about the abstract perception of TIME. The MONEY frame (which pertains to the concrete domain) includes the perspective of quantity so we can have more o less money to buy things, we can lose

money and much more. Thus, the TIME IS MONEY metaphor stands as a representation of the mappings from the concrete conceptual part of the domain related to MONEY to express experiences in which the focus of the cognitive effort lies on the abstract concept TIME. Examples include "don't waste your time", "time is a precious gift", "time is priceless". (Adapted from Lakoff & Johnson, 1980).

2.1.2.4 Concepts, domain and frames.

We can understand concepts as the basic units of our thoughts, and domains as a set of interrelated concepts that provide substance to each of the other concepts. At the moment of speaking, or thinking in words, not all of them activate in our brain together at the same time, but according to a pattern that links just some of them into a coherent whole (Lakoff, 1990).

This coherent set of concepts that activates together and which provides us with particular experiences (same words, different coherent experiences) is the frame, or the set of concepts that conjoin to provide a specific meaningful linguistic perception of reality. According to Fillmore (1975, p. 124), the word frame stands "for any system of linguistic

choices-- the easiest cases being collections of words, but also including choices of grammatical rules or linguistic categories-- which can get associated with prototypical instances of scenes" hence “[t]he term frame highlights the semantic supporting function of domains for concepts, and also the hypothesis that domains have a structure that is more than a list of experientially associated concepts” (Clausner and Croft, 1999, p. 2).

The term frame was introduced by Fillmore (1975) in order to observe the fact that concepts are related to domains in such a way that each experience activates a specific number of this interrelated set of conceptual units. These lexical concepts providing a semantic frame that activates only a specific portion of the whole conceptual domains "that link together as a system, which impose structure or coherence on some aspect of human experience, and which may contain elements which are simultaneously parts of other such frameworks." (Fillmore, 1975, p. 123).

Thus, in the appropriate context if I utter a word, the lexeme will activate a whole series of other concepts that relate to the word in a coherent system closely related to the experience in which it is embedded.

As M. Petruck (1996, p. 1) explains, "[a] FRAME is any system of concepts related in such a way that to understand any one concept it is necessary to understand the entire system; introducing any one concept results in all of them becoming available.". The classic example of the way in which frames provide a coherent support that unites our bodily experience with our linguistic system dates back to Fillmore (1975): "Our language provides us with orienting and classifying linguistic frames – such as UP/DOWN, FRONT/BACK and LEFT/RIGHT – which we could not understand, or could not easily understand, if we lacked bodies or if we lacked a body image." (p. 123). In a few words, we can state that concepts are embedded in a domain and domains are made up by frames, and frames are constituted by image schemas and image schemas instantiate in lexical concepts (for instance, the spatial relation: UP/DOWN).

Hence, our conceptual system stands not only as an interrelated set of lexical entries linked together logically, but as a self contained whole of on-going-experiential-wording. The relation body-environment-culture seems to be constantly reanalyzed and synthesized by the relation existing

between our conceptual system and our experience of it (by means of lexical concepts which instantiate in our utterances) in the world.

2.1.2.5 Frame, perspective and scene.

Concepts stand as those minimal units that make up our thoughts. These minimal units inhere within a quite complex net of other concepts that provide a set of related series of experiences stored as lexical entries, or words. Besides, it is known that at the moment we speak or use one of them, they do not activate the whole domain (i.e. the set of all conceptual frames) at the same time, but only that part which is coherent with the experience the speaker is having at the moment of speaking in order to interpret a particular textual event. Be this filter the frame.

It is argued that another main function of frames also consists in providing a specific perspective to the linguistic abstraction of the real event. This is the moment in which the lexical entry, or concept, finally acquires its full quality in relation to one of our specific experiences as speakers (Fillmore, 1975).

In other words, "[t]he different words assume different perspectives

on or schematizations of the same scene; understanding the choice of words for talking about that scene requires appealing to the history of events leading up to it." (Petruck, . 1996, p.3). An example of the way in which this whole process takes place is explained bellow by Petruck (1996, p. 2):

> The elements include a buyer, a seller, goods, and money. […] Among the large set of semantically related verbs linked to this frame are *buy, sell, pay, spend, cost*, and *charge*, each of which indexes or evokes different aspects of the frame. The verb buy focuses on the buyer and the goods, backgrounding the seller and the money; sell focuses on the seller and the goods, backgrounding the buyer and the money; [...] and so on.

The element which activates a specific representation (perspective) of a scene (all the elements which make up a linguistic experience of reality) is the verb (Fillmore, 1975; Fillmore, 1982, c.f. *valence*, p. 114). Thus, depending on the aspect of the frame we want to highlight (the seller, the buyer, the goods) we provide a specific perspective to the linguistic exchange and introduce a specific scene. Besides, "frames are associated in

memory with other frames by virtue of their shared linguistic material, and that scenes are associated with other scenes by virtue of sameness or similarity of the entities or relations or substances in them, o their contexts of occurrence". (Fillmore, 1975, p. 124; c.f. *The word and the context* in Addreassen, 1997, pp. 9-15).

As a summary it has been asserted that concepts are related to our most basic experiences. These have been abstracted as image schemas which have been synthesized as lexical concepts (UP/DOWN). These minimum units of linguistic perception inhere in the conceptual domain, which corresponds with a whole of related experiences. These domains are made up by different frames. Each frame activates a part of the domain in which the lexical concept inheres and these frames introduce different scenes and perspectives.

This thesis makes use of the conceptualization of concept as explained above in order to describe the domain of the concept LANGUAGE.

2.2 Conceptual metaphor theory.

2.2.1 Cognitive linguistics and conceptual metaphor theory.

According to Steen et al. (2010) the place that Lakoff and Johnson's approach to metaphor has in CL can be considered as a milestone in the development of CL as a school of thought, because it

> has not only been essential for the development of cognitive linguistics as a school of linguistics itself but has also affected many other disciplines concerned with the study of metaphor, including philosophy, poetics, psycholinguistics and psychology, discourse analysis and communication studies and anthropology. (p. 758)

According to Kövecses (2010), the insights provided by the conceptual metaphor theory reach at least the next paradigms: the neural theory of metaphor, the theory of conceptual integration, metaphor in discourse, the relationship between embodiment and metaphor, the embeddiness of metaphor in cultural context, the nature of mappings, metaphor in gestures, the study of multimodal metaphor, metaphor identification.

Finally, the number of research and areas in which conceptual

metaphor theory is being applied increases dramatically each year. Just to mention a couple of examples, cognitive metaphor theory has been also used to understand the modeling approaches in the physics of negative energy (Dreyfus, Geller, Gouvea, Sawtelle, Turpen & Redish, 2014) and in sociology to understand the way in which sociologists have approached toward the theme of resilient communities (Harrison, 2013).

2.2.2 Reddy's Conduit Metaphor.

In 1979, Reddy's study on the conduit metaphor attested the fact that the linguistic behaviour of American speakers in relation to the specific event of communication failure was vastly determined by the linguistic environment rather than by the real object of perception. Its central issue was supported by hundreds of examples taken from real commentaries made by language teachers to student's writing samples. They showed the fact that metaphorical processing forms part of our cognitive subjective system as such, not just as a conscious literary or creative strategy of language use. In particular, Reddy's observation starts at the point in which communication among people “fails or goes astray” (1979, p. 286). This

phenomenon is characterized by the use of words that imply that “language transfers human thoughts and feelings” as in "[t]ry to get your thoughts across better." (1979, p. 286).

His observations correspond to two frameworks by means of which American speakers -subconsciously- configure their experience regarding the domain of language. The major framework “sees ideas as existing either within human heads or, at least, within words" (Reddy, 1979, p. 291). The minor framework “overlooks words as containers and allows ideas and feelings to flow, unfettered and completely disembodied, into a kind of ambient space.” (Reddy, 1979, p. 291).

According to the author, the most important observation of his article is that those frameworks create a problem of perception which is “immune to resolution by appeal to the facts” (Reddy, 1979, p. 285). It consists in that decoders of linguistic information seem to be passive characters when decoding a message. According to the linguistic evidence “it is easier, when speaking and thinking in terms of the conduit metaphor, to blame the speaker for failures. After all, receiving and unwrapping a

package is so passive and so simple- what can go wrong?" (Reddy, 1979, p.p. 288-289).

The linguist observed that the conduit metaphor activates the frame in which the sender of a message is subconsciously ascribed with the whole responsibility of making the act of communication a successful event. The receiver just has to decode a message (open a box) and automatically perceive a perfect meaningful sense. Thus the fact of achieving or failing understanding is blamed on the sender only. But for a message to be properly formed, a major quantity of "energy" must be spent by the addresser and the addressee as well (Reddy, 1979, p.p. 295-296).

Actually, according to the linguist, when facing problems of communication due to the use of language, "of the entire metalingual apparatus of the English language, at least seventy percent is directly, visibly, and graphically based on the conduit metaphor." (Reddy, 1979, p. 308). Thus, a frame conflict in the reality that speakers are experiencing, a "semantic pathology" (Reddy, 1979, 299) emerges due to the use of a specific semantic pattern instead of another. Pathology which will arise

"whenever two or more incompatible senses capable of figuring meaningfully in the same context develop around the same name" (Reddy, 1979, p. 299). Finally, the construction "communicate your feeling *using* simpler words" instead of "communicate your feelings *in* simpler words" (Reddy, 1979, p.p. 307-308) avoids the conduit metaphor. The problem may arise with the word in, because it can activate a whole series of the conduit metaphor.

The next section is of paramount importance because all the definitions to sort by type the metaphors in this study come from this source, specifically, from 2.2.3.2 Types.

2.2.3 Lakoff and Johnson's Metaphors We Live By.

2.2.3.1 The nature of conceptual metaphors.

From that starting point (i.e. Reddy, 1979), the seminal work of Lakoff and Johnson, "Metaphors We Live By" (1980) provided a body of evidence to prove the hypothesis that "[o]ur ordinary conceptual system in terms of which we both think and act, is fundamentally metaphorical in nature" (Lakoff and Jhonson, 2003, p. 4). And also the formal definition

Figure 1: The Conduit Metaphor
Adaptated from Reddy (1979)

Major framework:

(a) Language functions like a conduit, transferring thoughts bodily from one person to another.

(13) "You have to try to get your real attitudes *across* to her better"

(b) In writing and speaking, people insert their thoughts or feelings in the words.

(34) "It's very difficult to put this concept *into* words"

(c) Words accomplish the transfer by containing the thoughts or feelings and conveying them to others.

(59) "The feeling *arises from* the second paragraph"

(d) In listening or reading, people extract the thoughts and feelings once again from the words.

(56) "I *got* the idea of patience *from your* statement"

Minor framework:

(e) Thoughts and feelings are ejected by speaking or writing into an external "idea space".

(86) "Dr. b*rings out* some unusual thoughts on the matter"

(f) Thoughts and feelings are reified in this external space, so that they exist independent of any need for living human beings to think or feel them.

(107) "That concept has been *floating around* for centuries"

(g) These reified thoughts or feelings may, or may not, find their way back into the heads of living humans.

(126) "You have to *absorb* Plato's ideas a little at a time"

states that *"[t]he essence of metaphor is understanding and experiencing one kind of thing in terms of another."*. (Lakoff and Johnson, 1980, p. 455).

The work establishes that abstract concepts are actually understood in terms of the concrete aspects of our lives. Such as our body relations and fundamental cultural knowledge that build up our basic representations of the environment and society. In a few words, "there is no other way how to comprehend [abstract] concepts in terms of something that emerges from our experience with the (sic) material world" (Bata, 2009, p. 12). Hence, "[i]f we are right in suggesting that our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor" (Lakoff and Johnson 2003, p. 4). Thus the nature of conceptual metaphors consists in that the process of understanding abstract concepts will necessarily need at least "a set of correspondences between two conceptual domains, with linguistic metaphor deriving from conceptual structures" (Tretjakova, 2014, s.d.).

These two conceptual domains are known as the source and target

domains. The target domain is always an abstract concept and the source is always a concrete one. Two of the most well known examples are the LOVE IS A JOURNEY and ARGUMENT IS WAR metaphors (Lakoff and Johnson, 1980). The target domain is named first and the source next. The use of capital letters means that we are dealing with a concept which is construed metaphorically in the mind of the speaker, not a definition. Among the characteristics of them lies the fact that the metaphor will "highlight" one aspect of the concept and "hide" others. (Lakoff and Johnson, 2003, p.p. 10-14).

The salient characteristics attributed to conceptual metaphors are the unidirectionality of mappings; the mapping of an abstract target domain from a concrete source domain, and, the systematic mapping of concepts. (Lakoff and Johnson, 1980; 2003).

The unidirectionality of mappings means that the mappings never occur but in the direction TARGET IS A SOURCE or TARGET AS A SOURCE. For instance, in the conceptual metaphor LOVE IS A JOURNEY mappings of the sort A JOURNEY IS LOVE are not part of our

conventionalized ways of speaking (i.e. conceptualizing) about journeys (Lakoff and Johnson, 1980). In conceptual metaphor theory, at the linguistic level, these mapping are recurrent already-stored patterns and their form depends a lot on both the scene and the perspective introduced by the words (Lakoff and Johnson 1980, 2003; Lakoff, 1990).

The second characteristic simply means that we perceive abstract concepts with words that inhere in the concrete domain. For instance, think about the PP 'in the *essence* of language'. The cognitive subjectivist approach introduced by Lakoff and Johnson (1980) assumes that we understand such texts because they are rooted in the concrete domain of experience. Plants, flowers and things of the kind can actually be processed so that their essence can be extracted. Be it a dense liquid which contains their most important active properties. Thus, according to this view, it is possible to speak of the essence of abstract entities such as language, time, pain, etc., because our cognitive apparatus maps the concrete aspects of the concept essence (extracting the most important properties of something such as a plant or a substance) to the abstract concept language (extracting

the most salient aspect of it, as a grammar, or a dictionary).

Following the tradition, the new cognitive approach to study language uses capital letters to designate concepts. The authors also make an improvement introducing "mnemonic designation of the mappings" (Tretjakova, J. s.d.). This is their form: TARGET-DOMAIN IS SOURCE-DOMAIN or TARGET-DOMAIN AS SOURCE-DOMAIN as in the ARGUMENT IS WAR or LOVE IS A JOURNEY metaphors (Lakoff and Johnson, 1980). The same nomenclature in capital letters to designate target and source domains is used here. The categories proposed by Lakoff and Johnson (1980; 2003) are the next:

Figure 2: Types of conceptual metaphors.
(Adapted from Lakoff and Johnson, 1980)

a) Orientational metaphors:	they organize a whole system of concepts with respect to one another.
b) Ontological metaphors:	understanding our experiences in terms of objects, entities and substances.
c) Structural metaphors:	cases where one concept is metaphorically structured in another.

2.2.3.2 Types.

- Orientational Metaphors.

They constitute the basic source by means of which our conceptual system structures our perception of reality as a direct reflex of the way in which our body relates to the environment and our culture (Lakoff and Johnson. 2003, p. 15). They do "not structure one concept in terms of another, but instead organizes a whole system of concepts with respect to one another.". (Lakoff & Johnson 1980, p. 461). This is that they map basic spatial-temporal and volumetric orientations to cultural concepts such as happiness, sadness, temporal perception and many others. (Lakoff & Johnson, 1980, p.p. 461-463). The basic constructs of orientational metaphors are: UP-DOWN, IN-OUT, FRONT-BACK, ON-OFF, DEEP-SHALLOW, CENTRAL-PERIPHERAL, as in HAPPY IS UP "I'm *feeling up* today" (Lakoff & Johnson. 1980, p.p. 461- 462).

- Ontological Metaphors.

The key issue about them is that they help us "understanding our experiences in terms of objects and substances (Lakoff & Johnson, 2003,

Figure 3: examples of orientational metaphors.

Adapted from Lakoff and Johnson. 1980, pp. 463- 464

HAPPY IS UP; SAD IS DOWN	I'm feeling up; I'm feeling down
CONSCIOUS IS UP; UNCONSCIOUS IS DOWN	Wake up; He fell asleep.
HEALTH AND LIFE ARE UP; SICKNESS AND DEATH ARE DOWN	He's in top shape; He dropped death.
HAVING CONTROL OR FORCE IS UP; BEING SUBJECT TO CONTROL OR FORCE IS DOWN	I have control over her; He fell from power
MORE IS UP; LESS IS DOWN	My income rose last year; His income went down.

p. 26). Therefore, we can "pick out parts of our experience and treat them as discrete entities or substances of a uniform kind." (p. 26). They emerge at the time in which we think of "events, activities, emotions, ideas" (p. 26) so that we can talk about them as if they were concrete entities or

substances. The main aspects they cover include: referring, “we are working toward peace”, quantifying, “a lot of political power”, identifying aspects “the brutality of war dehumanizes us all”, identifying causes “he did it out of anger”, setting goals and motivating actions “he went to N. Y. to seek fame and fortune”. (Lakoff & Johnson, 2003, p.p. 26-27). According to the authors, ontological metaphors stand as one of the major sources of metaphorical conceptualization. Mainly because they enable us to "specify different kinds of objects" (Lakoff & Johnson, 2003, p. 29) with an unlimited number of different aspects of our life. These include "events, actions, activities, and states [...] Events and actions are conceptualized metaphorically as objects, activities as substances, states as container" (op. Cit., p. 31) As examples the authors mention the ontological metaphors THE MIND IS A MACHINE ("My mind just *isn't operating* today") THE MIND IS A BRITTLE OBJECT ("Her ego is *very fragile"*) and the RACE IS set of metaphors:

> Are you in the race on Sunday? (race as CONTAINER OBJECT)

Did you see the race? (race as OBJECT)

There was a lot of good running in the race. (running as a SUBSTANCE in a CONTAINER)" (Adapted from Lakoff &Johnson, 2003, p. 31).

Finally, the last set of recurrent ontological metaphors are the PERSONIFICATION metaphors. They "allow us to comprehend a wide variety of experiences with nonhuman entities in terms of human motivations, characteristics, and activities." (Lakoff & Johnson, 2003, p. 34) Examples include: His theory *explained* to me the behavior of chickens raised in factories. This fact *argues* against the standard theories. (p.34).

In order to provide a summary of the importance ontological metaphors have in our daily lives, the next quote stands as a tour de force:

> Ontological metaphors like these are so natural and so pervasive in our thought that they are usually taken as self-evident, direct descriptions of mental phenomena. The fact that they are metaphorical never occurs to most of us. We take statements like "He cracked under pressure" as being directly true or false. (Lakoff and Johnson, 2003, p. 29).

Figure 4: Examples of ontological metaphors

Referring:	"*that* was *a beautiful* catch"
Quantifying:	"there is *so much* hatred in the world"
Identifying aspects:	"the *brutality* of war dehumanizes us"
Identifying causes:	"the *pressure* of his responsibilities caused his breakdown"
Setting goals and motivating actions:	"he went to New York *to seek* fame and fortune"
Personification:	"Inflation has robbed me of my savings. "

Here we assume that ontological metaphors, then, must form an integral part of the discourse present in the texts studied. The topic of overall coherence in the use of cognitive metaphors is not studied here. Nonetheless, evidence seems to suggest that concepts usually inhere in systems that contradict perception of reality if put as arguments at the same time in the same proposition. Think of the conduit metaphor and the fact that people imagine language as a container (concrete) and also as an entity living in a "kind of disembodied space" (Reddy, 1979, p. 291).

- Structural Metaphors.

The main definition stands as “cases where one concept is metaphorically structured in terms of another” (Lakoff, and Johnson, 2003, p. 15). As example we can quote THE THEORIES ARE BUILDINGS metaphor and the example “he has constructed a theory”.

> Structural metaphors allow us to do much more than just orient concepts, refer to them, quantify them, etc., as we do with simple orientational and ontological metaphors; they allow us, in addition, to use one highly structured and clearly delineated concept to structure another. (Lakoff and Johnson, 2003, p. 53)

They recognize three types: marginal, conventional and new.

- Marginal

Marginal metaphors are expressions of two kinds: literal dead and literal live.

- Marginal literal dead

They consist of a quite peripheral and conventional use of words, such as the use of the word “foot” to refer to mountains as in “the

foot of the mountain". They are not systemic in as much that there is only one mapping from our body parts to refer to the mountains so that its use is rather fixed an specific (Lakoff & Johnson, 2003, p. 54).

- Marginal literal live

They consist in the most basic (i.e. literal) use of a mapping, as happen s with the word "foundation" in the metaphor "THEORIES ARE BUILDINGS" and metaphors such as "the *foundations* of the theory are here" (Lakoff & Johnson, 2003, p. 54). They are made up by so common patterns of visualization that most people do not even imagine them as metaphors at all.

- Conventional or conceptual imaginative live.

They constitute extensions of marginal literal live metaphors, specifically, "instances of the unused part of the literal metaphors" (Lakoff & Johnson, 2003, p. 54) such as "these facts are the bricks and mortar of my theory" or "his theory has thousand of little rooms and long winding corridors" (Lakoff & Johnson, 2003, p. 54).

- New Imaginative Novel.

They are closely related to the creation of new meaning and are understood as "instances of novel metaphor, that is [as] a new way of thinking about something". (Lakoff & Johnson, 2003, p. 54) The example given by the authors is "classical theories are patriarchs who father many children, most of whom fight incessantly." (Lakoff and Johnson, 2003, p. 55). Usually, structural metaphors can be mapped and a grid like the next one is usually drawn in order to appreciate what parts of the concepts are taken to structure the abstract target domain:

Figure 5: Mapping of LOVE IS A JOURNEY metaphor

(Evans, V. 2014: 77)

Source domain: JOURNEY	Mappings	Target domain: LOVE
TRAVELLERS	→	LOVERS
VEHICLE	→	LOVE RELATIONSHIP
JOURNEY	→	EVENTS IN THE RELATIONSHIP
DISTANCE COVERED	→	PROGRESS MADE
OBSTACLES ENCOUNTERED	→	DIFFICULTIES EXPERIENCED

DECISIONS ABOUT DIRECTION	→	CHOICES ABOUT WHAT TO DO
DESTINATION OF THE JOURNEY	→	GOALS OF THE RELATIONSHIP

- Image metaphor

This subcategory of metaphor does not appear in Lakoff and Johnson's Metaphors We live By (1980). It was introduced later by Lakoff (1987) with the purpose of providing an account of metaphors like the one which appears in André Breton's *Free Union* in which he writes, "My wife... whose waist is an hourglass." (Lakoff, 1987, p. 219).

According to Lakoff, "this is an image mapping in which the mental image of an hourglass is mapped onto the mental image of the wife, with the central narrow portion of the hourglass corresponding to the wife's waist" (Lakoff, 1987, p. 219). To understand this kind of metaphors we have to recognize the existence of mental images (Kosslyn, 1980, and Cooper, 1982 in Lakoff, 1987) regarding the acceptance of the reality of mental images from cognitive science. Then, these specific kind of pictorial

references "are acquired largely unconsciously and automatically over the years by members of a cultural community." (Lakoff, 1987, p. 220). In relation with the specific example, "to map the hourglass image onto the woman image, both images must be structured in terms of a general shape of the same sort" (Lakoff 1987, p. 220).

As it can be observed, the basic rule regarding the conceptual theory of metaphor that states that it is a result of the mapping between two different conceptual domains has not changed. Be the main difference that the mapping is just working at different mental levels. That of the mental images of the pictorial towards cues of the linguistic kind, but not at the propositional level between textual concepts which inhere in different domains. According to Lakoff these kind of metaphors stand as "one-shot mapping.". (Lakoff, 1987, p. 221).

2.2.3.3 What counts as literal?

According to the authors, absolute use of literal language is by far a difficult premise to achieve from the point of view of the cognitive theory

Figure 6: characteristics of image metaphors

Adapted from Lakoff (1987)

1. One-shot mappings, as their name implies, are not used over and over again; that is, they are not conventionalized.
2. They are not used in everyday reasoning.
3. There is no system of words and idiomatic expressions in the language whose meaning is based on them.
4. They map image structure instead of propositional structure.
5. They are not used to understand the abstract in terms of the concrete.
6. They do not have a basis in experience and commonplace knowledge that determines what gets mapped onto what.

of metaphor. Nonetheless, when people use conceptual metaphors like the next ones:

IDEAS ARE FOOD: What he said left *a bad taste* in my mouth.

IDEAS ARE PEOPLE: The theory of relativity *gave birth* to an

enormous number of ideas in physics.

IDEAS ARE PLANTS: His ideas have finally come to *fruition.*

(Adapted from, Lakoff and Johnson, 2003, pp. 47-49).

According to these kind of everyday way of speaking, "we include them in what we have called literal expressions structured by metaphorical concepts". (Lakoff & Johnson 2003, p. 52). Nonetheless, under the objectivist point of view, these kind of metaphors stand as literal use of language. Metaphors which have been conventionalized and that now form part of our everyday ordinary language stand as simple "dead" metaphors, literal expressions. In agreement with this thesis, we accept Lakoff and Johnson's premise that there are some conceptual metaphors that seem to be "normal" constructs in our everyday language. Nonetheless, we have to remind the reader that they have a conceptual metaphorical basis. What is more, in this thesis, we presuppose that, no matter the metaphorical degree -whether standard or novel imaginative metaphors- all abstract concepts, by force, are metaphorically construed in our cognitive system.

2.2.4 Other sources and observations regarding the nature of conceptual metaphors.

2.2.4.1 Different levels of manifestation: conceptual and discursive.

According to Evans (2014) the cognitive theory of metaphor should make a distinction between at least two different cognitive levels in which the process of mapping from the concrete to the abstract takes place. Specifically, between the conceptual and discursive levels. The specialist argues that "[c]onceptual metaphors are mappings that inhere in the conceptual rather than the linguistic system." (p. 84). They are characterized as being "relatively stable in long-term memory and [...] invariably activated during symbolic processing, whether due to linguistic or non-linguistic processing" (p. 84). On the other side, "discourse metaphors arise in language use to facilitate a linguistic mediated communicative intention." (p. 84). They correspond to a "generalized analogical processing at the conceptual level" and correspond to mappings where a concept links to another concept, the "lexical concept" and not a source concrete domain as such. (Evans, V. 2014: 84). Thus, the same working principle described by Lakoff and Johnson (1980; 2003) makes possible the mapping. Discourse metaphors are constituted by the same

kind of mappings as conceptual ones but they do not form part of our conceptual system. Thus, they are not frequent nor form specific patterns.

According to our argumentation, this is nothing but another version of conceptual imaginative and novel metaphors already described by Lakoff and Johnson (1980). I believe that the main distinction is that, as they do not form part of our everyday normal patterns of mappings, they can actually belong to another different category such as the one described by Evans (2014).

Further on, some authors observe that, regarding metaphor comprehension, the so called literal and dead metaphors are understood faster than imaginative live and novel metaphors (Blank, 1988; Coulson, 2008, and Giora, 2008 in Evans, 2014, p. 84). Consider as example *Fear is a roadblock to success.* According to the author, roadblock is the linguistic cue which causes the alleged linguistic obstacle in understanding the literal meaning of the sentence. (Evans, 2014, p. 84).

2.2.4.2 Deliberate metaphor.

Deliberate metaphors "implicitly instructs the addressee to think

about one thing in terms of something else" (Steen, 2011, p. 84). That does not necessarily entails the fact that the addresser nor the receiver of the message will be conscious of the fact that a metaphor is going to be construed. It is the linguistic cue which stands as an activator of a metaphorical process. They

> differ from non-deliberate metaphors in that they involve mandatory attention to the fact that they are metaphorical […] when addressees must pay attention to the source domain as an independent conceptual domain (or space category) that they are instructed to use to think about the target of the metaphor". (Steen, 2011, p. 84)

The example comes from Shakespeare's Sonnet 18: "Shall I compare thee to a summer's day?". According to the author, 'the something else' -the activator- comes first in the sentence, so that it opens up the cognitive process which seems to work at the moment in which a conceptual metaphor is faced. It also stands as the mechanism that allows human beings to make imaginative and novel combinations (c.f. Lakoff and Johnson imaginative live and novel conceptual metaphors, 1980).

According to the present study, Steen's deliberate metaphors can be

related to the different levels observed by Evans (2014) because they do not form part of our conceptual system as dead or literal conceptual metaphors (Lakoff and Johnson, 1980). They seem to be part of the discourse level rather than the conceptual. Take as evidence the fact that they do not form long lasting patterns of linguistic behaviour, but rather see to be quite novel use of language. Nonetheless, It is argued that it is the same mechanism (inter domain mappings) the thing which supports the two levels of meaning construction in context.

2.2.4.3 Other aspects to consider.

Finally, primary metaphors (Graddy, 1999) are characterized by "very simple mappings -i.e., they map as few elements, properties, and relations as possible, while still referring to coherent (if schematic) scenes, and still comprising enough structure to account for certain linguistic expressions." (Graddy, 1999, p. 12) Examples of these metaphors are the ones deriving from the primary metaphor CONSTITUENTS ARE CONTENTS as in "This drink is *loaded* with vitamins" (p.12).

Next to the core issues of conceptual metaphor research, authors

agree in that

- they present a systemic nature which is not altered by language use. (Evans. 2013).
- they represent a different type of knowledge which is different from other types of linguistic metaphors (Evans, 2013; Graddy, 1999).
- they constitute the result of frequent and strong relations of our linguistic experience of the world (Lakoff & jhonson, 1980; 2003, Lakoff 1987; 1990; Evans, V. 2013: Kövecses, 2010)
- conceptual metaphors are activated automatically (Casasanto and Boroditsky, 2008).

Even "in the absence of language: […] subjects cannot help activating spatial representations when performing temporal processing" (Casasanto and Boroditsky, 2008) hence providing evidence of the double nature of the domains when representing one aspect of reality by means of different activities.

Steen (2011) argues that the nature of the conceptual metaphor is three-dimensional, that it has a linguistic form, a conceptual structure, and

a communicative function (Steen, 2008; 2011 b).

Zinken (2013) agrees with Evans (1997) in that the essence of metaphor is change. They constitute a key cognitive strategy to "make something difficult comprehensible" because "they give a name to something inexpressible." (Zinken, 2013, p.p. 1-3). They become "meaningful in the process of discourse, rather than as 'having' […] meaning: [they] become meaningful when [they] can be integrated into, and motivate a continuation of, the ongoing narrative" and they stand as "a prime example of the openness of communication to new understanding." (p. 3). As it can be appreciated, it can be asserted that, a) cognitive metaphor theory is a tool which allows the observation of concepts, and, b) that, as such, still many studies regarding, both, its nature and applications are still to be made.

2.2.4 Problematic:

The main problematic and gap observed is that linguistic science (the language which makes the science of linguistic possible) has not been studied systematically using modern cognitive metaphor theory, and the

theory is being used to study the behaviour of the concepts of other sciences and disciplines.

First of all, it is problematic because up to know, specialists of language ignore up to what extent the assertions by mean of which they observe linguistic phenomena is and has been obscured by the use of one conceptual metaphor instead of another to refer to the object of their inquires. Next to that, it has been demonstrated thoroughly that this approach actually helps to observe the behaviour of lexical items at the conceptual level. According to Gibbs (2008) it stands as a well demonstrated linguistic truth the ubiquity of metaphor in both, ordinary and specialized language. Nonetheless, the concepts that make up the tree of linguistics have not been studied yet.

What is more, if it is true that our conceptual system works at the subconscious level, if "our conceptual system is not something we are normally aware of." (Lakoff & Johnson, 2003, p. 4), then the proposition that even the language under the control of the expert cannot escape from the inner laws that sustain our linguistic behaviour becomes a continent

that up to now has not been further explored.

Here we also take as an a priory assumption and working hypothesis the assertion that states that concepts are metaphorical in nature (Lakoff and Johnson 1980, 2003).

The scope and aim of this study does not include to check whether our concepts "govern" (Lakoff & Jhonson, 1980; 2003) our thoughts or not. This study is an attempt to systematically draw a clear picture of the way in which the word language is conceptualized in the register of two texts of the same author from the biolinguistic subfield.

In this study we do not attempt to track the way in which or how the domain related to the word language changes (i.e. under which circumstances). Specifically, in this study we try to show the different frames in which the word language emerges and the perspective it provides.

CHAPTER THREE: METHODOLOGY

3.1 Corpus

Specifically, the corpus consists of a correlation of three dependent variables:

1. all the clauses or phrases in which the words language, languages, and the acronyms Fl (Language Faculty), FLN (Language Faculty in the Narrow Sense) and FLB (Language Faculty in the Broad Sense) appear.

2. the cognitive metaphor they activate (written in capital letters) and

3. the type of conceptual metaphors to which they form part.

The information is displayed in a grid which is explained and drawn bellow. The grid also stores the information of the extraction of the target cues from the text. Appendix 3 constitutes the grid of Text 1 and Text 2.

3.2 Data collection

It starts from the presupposition that the target lexemes or acronyms refer to an abstract and not to a concrete kind of entity. The reasons to do

this are two. First, with the aim of facilitating the process of collection and analysis of the data. Second, to try as much as possible to make a formal objectivist approach to name the cognitive metaphors. Besides, the two approaches, explained bellow, to do this need much more time in order to follow their procedures appropriately if the specialist has to deal with both, manual procedures to extract target lexemes from discourse, and manual procedures to detect conceptual metaphors from likely not conceptual metaphors.

3.2.1 Conceptual metaphor identification

One of the key issues regarding the reliability of modern linguistic research has to do with the reply-ability of the methods used by the linguist to do both, the extraction of a corpus to work with and a set of defining principles or definitions in order to appropriately interpret the data he or she has gathered. Unfortunately, this is not the case regarding the origins nor today's widespread approach linguists have to work with conceptual metaphor theory. In words of Nyarko, "metaphor researchers tended to rely on unilateral introspection in identifying both linguistic and conceptual metaphors." (2010, p. 8).

Both, Reddy's Conduit Metaphor (1979) and Lakoff and Johnson's Metaphors We Live By (1980, 2003) used the so called "unilateral introspection" of the specialist to do both, detect and name the metaphors present in the non-literal use of abstract words. Actually, "[u]ntil recently, no explicit procedures had been established to identify both linguistic and conceptual metaphors in cognitive metaphor research [...] This has been criticised as potentially causing research bias in metaphor research." (Nyarko, 2010, p. 8).

The first official attempt in order to accomplish this task was made by Steen in 1997 (Steen, G. 1999; 2002; 2005; 2007). It consists in:

1. Identifying metaphorical focus.
2. Identifying metaphorical idea.
3. Identifying metaphorical comparison.
4. Identifying metaphorical analogy.
5. Identifying metaphorical mapping.

Taken as a base, this model was further formalised in 2005 by the Pragglejaz group in the method known as The Metaphor Identification Procedure (MIP):

1. Read the entire text/discourse to establish a general understanding of the meaning.

2. Determine the lexical units in the text/discourse.

3a. For each lexical unit in the text, establish its meaning in context, i.e., how it applies to an entity, relation or attribute in the situation evoked by the text (contextual meaning). Take into account what comes before and after the lexical unit.

3b. For each lexical unit, determine if it has a more basic contemporary meaning in other contexts than the one in the given context. For our purposes, basic meanings tend to be:

- more concrete; what they evoke is easier to imagine, see, hear, feel, smell and taste.
- related to bodily action.
- more precise (as opposed to vague).
- historically older.
- basic meanings are not necessarily the most frequent meanings of the lexical unit.

3c. If the lexical unit has a more basic current/contemporary meaning in other contexts than the given context, decide whether the contextual meaning contrasts with the basic meaning but can be understood in comparison with it.

4. If yes, mark the lexical unit as metaphorical.

Nyarko (2010, p. 8), in the study of the Akan metaphors, makes up

her own approach, which consists in a variation of the MIP:

> the entire transcription of the discussion was read to establish a general understanding of the meaning of the text; then the text was divided into lexical units after which I determined whether any of the lexical units were believed to have been used metaphorically, i.e. indirectly. Where lexical units in the discussion had been used metaphorically, I determined whether they had more basic meanings than the contextual meanings, where basic meaning relates to any of the following: (i) a more concrete meaning, e.g. smell, taste, feel, see, hear, bodily action, (ii) a more precise as opposed to vague meaning or (iii) a historically older meaning. The method also includes checking corpus-based dictionaries if in doubt about the meanings of a word. If the contextual meanings were different from the basic meanings, I decided whether the two meanings contrast but can be understood in comparison with each other. If the contextual meanings were related to the basic meanings by some form of similarity, then

the lexical units were marked as metaphorical.

The main difference introduced here is that we used a lexical perspective and a definition ("the sentence has true face value") for naming the metaphors.

In relation to these kind of studies, specialists usually begin by looking at a metaphor then make a formal definition of it and then search for cases of it in natural languages. Here we looked for specific words (lexemes and acronyms) and then a study of the immediate context (phrases and/or clauses) followed. As a matter of fact, the last step in this procedure is dealing with the name and type of conceptual metaphor.

A comparison between the canonical approach to metaphor and the one introduced here is carried out to observe the main changes in the results which might appear when using the canonical and this exploratory technique in CHAPTER FIVE: DISCUSSION.

3.2.2 Manual procedure to extract phrases or clauses with the target cue.

The goal here is to manually choose the context that permits the application of a formal definition to the target word in order to check whether it is used literally or non literally. Usually, a phrase or a clause will

be enough to determine weather the target lexeme is being used literally or not. Here we used the next question: is the linguistic cue X being used literally in [Phr / Cl]? Yes / no.

Example:

M1. 48 32 the course of *development of* language *in* the organism

First we ask the next question: is the lexeme language being used literally in NCL M1. 48 32? Which is to decide whether LANGUAGE literally develops, like a biological entity, such as the course of development of the foetus in the organism. The strategy used here starts from the presupposition that the lexical element language represents, most of the times, an abstract concept. Therefore, it cannot literally develop in the organism because language is not an organism. It is assumed in this study that only biological beings develop and that language is not a biological being hence it cannot literally develop. Thus the answer is no.

3.2.3 Procedure to name the cognitive metaphors

Linguistic metaphor naming procedure: it is written in capital letters according to the next definition: the conceptual name in capital letters provides the target lexeme with the felicity conditions that satisfy a literal

use of it within the conceptual metaphor paradigm.

Example:

T 2 2.6 a) *the tension* between universal and particular aspects of language.

The noun phrase T2 2.6 a) will be understood literally under the felicity conditions that equate language with a natural force, such that: LANGUAGE IS A NATURAL FORCE/ ELECTRICITY metaphor satisfies the necessary conditions in which the word language can be thought of as having "tensions" literally between its aspects, so it can be taken at face value.

3.2.4 Formal set of definitions to sort the conceptual metaphors by type.

- Orientational Metaphors: they map basic spatial-temporal and volumetric orientations to cultural concepts such as happiness, sadness, temporal perception and many others. (Lakoff & Johnson, 1980, p.p. 461-463). The basic constructs of orientational metaphors are: UP-DOWN, IN-OUT, FRONT-BACK, ON-OFF, DEEP-SHALLOW, CENTRAL-PERIPHERAL, as in HAPPY IS UP "I'm *feeling up* today" (Lakoff & Johnson. 1980, p.p. 461- 462).

- Ontological Metaphors: they help us “understanding our experiences in terms of objects and substances (Lakoff & Johnson, 2003, p. 26). They are closely related to “events, activities, emotions, ideas” ((Lakoff & Johnson, 2003, p. 26) so that we can talk about them as if they were concrete entities or substances.

The main aspects they cover include: referring, “we are working toward peace”, quantifying, “a lot of political power”, identifying aspects “the brutality of war dehumanizes us all”, identifying causes “he did it out of anger”, setting goals and motivating actions “he went to N. Y. to seek fame and fortune”. (Lakoff & Johnson, 2003, p.p. 26-27). Personification: "Inflation has robbed me of my savings. " Examples: THE MIND IS A MACHINE ("My mind just *isn't operating* today") THE MIND IS A BRITTLE OBJECT ("Her ego is *very fragile"*) and the RACE IS set of metaphors.

Finally, here are the PERSONIFICATION metaphors. They "allow us to comprehend a wide variety of experiences with nonhuman entities in terms of human motivations, characteristics, and activities." (Lakoff & Johnson, 2003, p. 34)

- Structural Metaphors: They are "cases where one concept is metaphorically structured in terms of another" (Lakoff, and Johnson, 2003, p. 15). As example we can quote THE THEORIES ARE BUILDINGS metaphor and the example "he has constructed a theory".

There are three sub-types: marginal, conventional and new.

- Marginal: Marginal metaphors are expressions of two kinds: litera dead and literal live.
- Marginal literal dead: They consist of a quite peripheral and conventional use of words, such as the use of the word "foot" to refer to mountains as in "the foot of the mountain". They are not systemic in as much that there is only one mapping from our body parts to refer to the mountains so that its use is rather fixed an specific (Lakoff & Johnson, 2003, p. 54).
- Marginal literal live: They consist in the most basic (i.e. literal) use of a mapping. For example, the word "foundation" in the metaphor "THEORIES ARE BUILDINGS" and metaphors such as "the *foundations* of the theory are here" (adapted from Lakoff & Johnson, 2003, p. 54).

- Conventional or conceptual imaginative live: They constitute extensions of marginal literal live metaphors, specifically, "instances of the unused part of the literal metaphors" (Lakoff & Johnson, 2003, p. 54) such as "these facts are the bricks and mortar of my theory" or "his theory has thousand of little rooms and long winding corridors" (Lakoff & Johnson, 2003, p. 54).
- New Imaginative Novel: They are understood as "instances of novel metaphor, that is [as] a new way of thinking about something". (Lakoff & Johnson, 2003, p. 54). Example: "classical theories are patriarchs who father many children, most of whom fight incessantly." (Lakoff and Johnson, 2003, p. 55).

3.3 Data Analysis 1

3.3.1 Research question

As the aim of this study is to provide an account of the conceptual domain in which the lexical concept LANGUAGE is present, the next questions must be answered:

Q.1. In which conceptual metaphors does the lexical item language, languages, and the acronyms (listed above) appear?

To answer Q.1 means to collect all the instances in which the words and acronyms mentioned appear, which, in agreement with the theory, is the same as exploring the domain in which those terms exist in the two texts. This also enable us to understand if there is a conceptual metaphor preferred instead of another. According to the theory, by far, ontological metaphors constitute the tendency by means of which abstract concepts are displayed in natural languages. (Lakoff & Johnson 2003).

3.4 Grid to extract the data.

To gather the data a grid was made. Its purpose was to facilitate the process of correlation between the target words, their context of occurrence, the cognitive metaphors they manifest and the type they belong to. The most important idea was to build a grid to collect textual and formal information in order to make the next correlation easily accessible:

Target word : context (Phr or CL) in CONCEPTUAL METAPHOR: Type

Which is read as "a target word (language) is in relation to the next Phr or CL in this COGNITIVE METAPHOR, of this type.

3.4.1 The grid

The data gathered in the grid correspond with

- Contextual information:
    1. The discourse type (written / oral)
    2. The register of the text (casual/ formal tenor, conversation, speech, drama, comedy, formal, academic, etc)
    3. The name of the text.
    4. The author(s) or speaker(s) of it.
    5. The target lexeme(s)
- Textual information:
    1. P: The paragraph number / the page number.
    2. SN: The number of sentence in the paragraph.
    3. Sentences: The sentences that make up the paragraph. They are copied in the grid and separated as consisting of single paragraphs and numbered in the slot SN (3).
    4. Clauses / Phrases: They contain the clause or the phrase in which the target lexemes are. Choosing between phrases or clauses depends on the presence of the conceptual metaphor. Sometimes just a nominal

phrase will make up a conceptual metaphor, sometimes a longer piece of text. Nonetheless, the extraction here is limited up to the clause level.

5. Metaphor focus identification: it consists in the words (nouns, verbs, adjectives and adverbs) that provide context to the target lexemes.
6. Linguistic metaphor naming procedure (above).
7. Types

According to the definitions presented above and Chapter 2: Theoretical Framework.

Figure 7: Grid to gather the data

Matrix 1

Discourse type:_____

Register:_____

Name:_____

Author:_____

Target lexeme(s):_____

P	S n	Sentences	Clauses / Phrases	Related attributes	Linguistic metaphor(s)	Type

3.4.2 Procedure to use the grid

1. Read the whole text to have a general idea of it.

2. Read the whole text again and highlight the target lexemes.

3. Copy the entire paragraphs and split them sentence by sentence within the "Sentences" box.

4. In the SN box, assign a number, starting from 1, to each of the sentences that make up the paragraph.

5. In the P box, write down the number of the paragraph starting from 1. The name of the chapter should be included if it is part of the textual information.

6. In the Clause/phrase box, extract the immediate context which the word appears. If it is a simple sentence, you can copy-paste the same text. If it is a complex sentence, you can decide upon extracting the clause in which the word appears, or only the phrase in which it is embedded. The goal is to extract the part that allows the researcher to do both, appreciate a conceptual metaphor and provide contextual evidence of it.

7. Write down the words that stand related to the word under study. In the box Related attributes, write +____ filling with the words which are

related to the lexeme to provide the metaphorical focus (i.e. truth face value).

8. In the box Linguistic metaphor(s) write down in capital letters the conceptual metaphor that fully fills the truth conditions which provide a literal meaning to the lexeme in the immediate context it appears.

9. Assign a type to the metaphor.

10. Check all the steps from 3 down twice.

The complete charts of Text 1 and Text 2 can be found in APPENDIX 2 and APPENDIX 3 accordingly.

3.5 Data analysis 2

To compare the data sets and draw conclusions regarding the research questions, the next procedures were used:

3.5.1 Types and percentage of occurrence.

The clauses and sentences are ordered by type and numbered following the list presented above. Then the frequency of occurrence is measured and expressed in numbers. Hence, the study question 1 and 2 can be answered.

3.5.2 Mapping schemes.

To facilitate the discussion of the study question schemes showing the mappings are made.

The mapping is a scheme that depicts the ecology between the next concepts:

1. the concepts (language, languages,)
2. the domain (target, source)
3. the concept's profile.
4. the words associated to each domain
5. the phrases and sentences that make a frame.

The different mappings will be used to draw the diagram which shows all the frames that make up the concept LANGUAGE in the texts studied. Finally, these two procedures also stand as sources to answer other issues regarding the theoretical framework. Other issues (naming the metaphors, types) regarding the theory are also developed in Chapter Four: Discussion.

Figure 9: representation of a conceptual frame.

LANGUAGE IS AN OBJECT METAPHOR

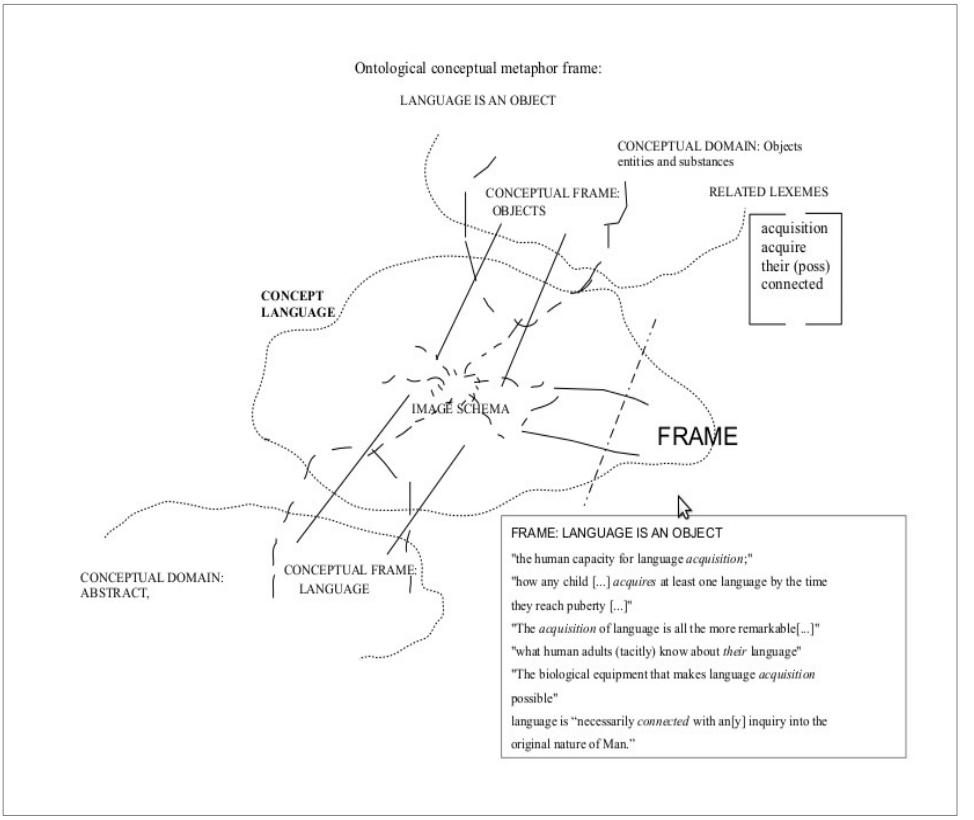


Figure 9 is a representation of the lexical concept LANGUAGE at the moment in which a cross-domain mapping takes place. It is believed that the mapping (the metaphor written in capital letters) activates a frame which is manifested by individual lexical entries which can combine in different sentences. The drawing depicts, at the center, the domain in which the lexical concept LANGUAGE exists. At the upper right appears a

depiction of the source domain (CONCRETE ENTITIES, OBJECTS) and at the lower left, the target domain (ABSTRACT ENTITIES, LANGUAGE). Key words in relation to the source domain are put in brackets. The region with the FRAME name indicates that the abstract concept LANGUAGE in conjunction with the opposite domain, provides a FRAME to manifest a specific set of lexical relations which provide, at the discourse level, a set of related sentences (same words, different sentences, different appreciation of events). The sentences in the box correspond to examples found in the texts studied. It is argued that the frames that provide the structure to the lexical entries is the object that obscures the object being observed. In the next section a depiction of the concept language and the different frames that make it up are shown. Hence, a diagram like this can be imagined with each of the different parts of the concept (the whole set of frames) and the conceptual metaphors they project. The specific shape drawn here is not a depiction of a real event, but it is an attempt to visualize that the different combinations of domains change the perception we have of the object which is being conceptualized. Here we argue that it is very difficult to either detect a change in the form concepts have, or

whether it is our perception the thing which has moved to a different part of the concept.

As a summary, each diagram will correspond with one type of conceptual metaphor, and the sum of all of them the domain in which the lexical concepts exist.

CHAPTER FOUR: RESULTS

The results of the two texts are depicted below in order to provide an answer to the study question. It is important to remember that the main objective of this study is to show the domain in which the lexical concept LANGUAGE exists and the way in which it manifests in two different texts of the same author.

4.1 Study question.

Q. In which conceptual metaphors does the lexical item *language*, *languages*, and the acronyms *FL, FLN*, and, *FLB* appear?

This question aims at the correlation of the next variables: a lexical item or an acronym correlated to a phrase or a clause correlated to a specific conceptual metaphor (written in capital letters) correlated to a type of conceptual metaphor.

This data will provide a conceptual macro, or the domain in which the specific target lexemes are involved. It was first gathered in Matrix 1

and Matrix 2 (Appendix 2 and 3).

The information here was sorted following the order of the elements as presented in the study question 1 *(language, languages, FL, FLN, FLB)*.

First the results of the text 1 were written, immediately next followed the results relative to the text 2.

The detail of all the correlations is found in the appendix 1.

4.1.1 "Language"

17 cognitive metaphors make the domain that provides with a conceptual body to the lexical concept LANGUAGE in the texts studied. They correspond either to a type and subtype of Ontological or Structural conceptual metaphor.

It is observed that the cognitive metaphors activate different subtypes and types of the same metaphors, such as LANGUAGE IS AN OBJECT or LANGUAGE IS A BUILDING metaphors. The first activates two different perspectives of the same ontological conceptual process of the scene (LANGUAGE IS AN OBJECT). It activates that of a concrete entity (*object*), that of the aspect of the entity (quality: *not natural object*), and a

personification of the entity (*permits, requires*). LANGUAGE IS A BUILDING manifests itself by different types of conceptual processes (Ontological, Structural) of the same scene. The Ontological, activates the identifying subjective aspect of the building (*no diversity of design*) and the Structural marginal literal live the concrete aspect of it (*this ability of building bridges across modules).* As a concrete entity, it becomes a point of reference as in the LANGUAGE IS A CONTAINER and LANGUAGE IS A PLACE metaphors, place in which *universality* and *diversity* coexist, next to a *single design, a single organ in a single species*. Next follows a detail of the metaphors of the concept"language" in the two texts.

Text 1

Language: 56 instances.

From all the 48 ontological metaphors, 22 (45.83%) correspond with the category Entity, substance or object. They were mostly distributed between LANGUAGE IS AN ENTITY (*our* human *knowledge* of language) and LANGUAGE IS A BIOLOGICAL ENTITY (how it [language] *evolved* in the species) metaphors (50%), the conceptual

metaphor the LANGUAGE IS AN INGREDIENT stands exceptional in the group: *the kind of* mind you *get* when you *add* language to it is *so different from* the *kind of* mind you can have *without* language. The next more frequent is LANGUAGE IS AN OBJECT (the *acquisition* of language) metaphor with a 26.92% of occurrence. The next most frequent subtype of ontological metaphor is Identifying aspects (the *logical problem* of language *acquisition*) metaphors with 17 instances (35,4%).

Almost as frequent as those mentioned above, the subtype of ontological metaphor, Identifying aspects, stands as a major choice among the strategies used by the author to refer to the concept LANGUAGE, with 16 instances. The metaphors they activate are: LANGUAGE IS AN OBJECT: attention shifted away from the problem of language *acquisition*; LANGUAGE IS A SUBSTANCE: With language, creativity *emerged*; LANGUAGE IS A BIOLOGICAL ENTITY: the logical problem of language *evolution*; and, LANGUAGE IS AN ENTITY: This is not to say that morpho-phonology *is not part of* language. In this list the conceptual metaphor LANGUAGE IS AN OBJECT leads the position with 11

different manifestations.

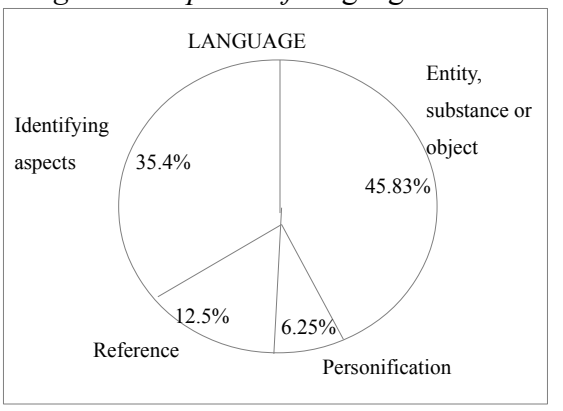
6 instances of the ontological subtype of reference metaphors were found: LANGUAGE IS A CONTAINER: on the existence of both universality and diversity *in* language; LANGUAGE IS A PLACE: *in* the *context of* language; LANGUAGE IS A BIOLOGICAL ENTITY: One's view on the *evolution* of language; and LANGUAGE IS AN ENTITY: one's *view of* language.

Finally, just 2 ontological, personification metaphors were found. They are: LANGUAGE (ACQUISITION) IS A MOVING OBJECT: why the acquisition process takes the path it takes; LANGUAGE IS A PERSON (ARCHITECT/GARDENER): this *ability of building bridges* across modules is directly related to language, specifically *the ability to* lexicalize concepts (*uprooting* them from their modules) and *combine* them *freely* via Merge.

Ontological metaphors of the subtype Identifying causes were not found.

figure 9

Ontological metaphors of language *in Text 1.*



The next type, Structural metaphors, of the subtype Marginal, literal live, 4 conceptual metaphors were found: DEVELOPMENT (OF LANGUAGE) IS A RIVER/ ROAD/ PATH: to understand the *course* of development of language in the organism; LANGUAGE ACQUISITION IS A SCIENTIFIC/ LEGAL PROCESS: the *evidence* that is available to them during the acquisition process; and, LANGUAGE IS A SOFTWARE: there is a basic *asymmetry* in the contribution to language *design* of the two *interface* systems.

Finally it was observed one Structural, conceptual, imaginative live/ novel metaphor: LANGUAGE IS A HEADED ORGANISM: children know that projections have to be headed, but have to figure out whether

their language is *head-initial* or *head-final*.

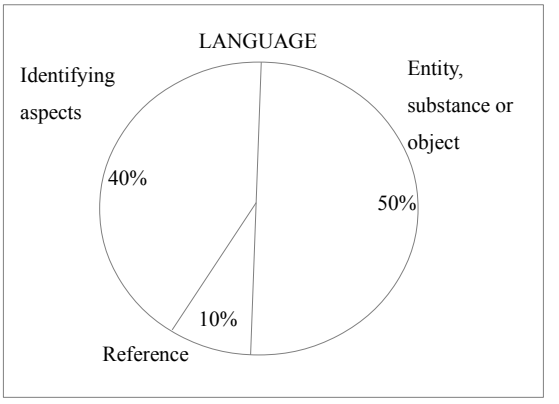
Text 2

Language: 25 instances.

From all the 20 ontological metaphors, 10 (50%) corresponds with the category Entity, substance or object. They were mostly distributed between LANGUAGE IS AN ENTITY and LANGUAGE IS A BUILDING/ SUBSTANCE metaphors. The next more frequent is LANGUAGE IS AN OBJECT metaphor with a 26.92% of occurrence. The next most frequent subtype of ontological metaphor is Identifying aspects metaphors with 8 instances (40%).

Figure 10

Ontological metaphors of language *in Text 2*



The numbers are similar in the two texts with the difference that personification metaphors were not found in text 2. The word language is ontologically depicted 82.75% of times in the text 1 and 80% in the text 2. Text 1 has almost a 100% more instances of the lexeme language (56) than the text 2, with only 25 samples.

4.1.2 "Languages"

Text 1.

4 Samples were gathered. 3 of them were ontological metaphors and 1 structural. The ontological metaphor which appeared is LANGUAGES ARE OBJECTS (OF KNOWLEDGE): the short time it takes for children to master *their* native languages. The other two are from the same subtype, reference: LANGUAGES ARE CONTINENTS: the uniformity displayed *within and across* languages during the acquisition process; and, LANGUAGES ARE CONTAINERS: on the distribution of lexical material *in* natural languages.

Figure 11

Examples of conceptual metaphors of language.

LANGUAGE IS A SUBSTANCE (Identifying aspect)	the "Cartesians" *saw* in the *essence* of language *with* language creativity *emerges*
LANGUAGE IS A BIOLOGICAL ENTITY (Reference) (Identifying aspects)	One's view on the *evolution* of language the *logical problem* of language *evolution*
LANGUAGE IS AN OBJECT (Identifying aspects)	how any child [...] *acquires* at least *one* language *With* language, the human mind *developed* into a key ring
LANGUAGE IS A PERSON (Structural, marginal, literal live).	this *ability of building bridges* across modules is directly related to language
LANGUAGE IS A SOFTWARE (Structural, marginal literal live)	there is basic asymmetry in the contribution to language design of the two *interface systems*
LANGUAGE IS A HEADED ORGANISM (Structural, imaginative novel)	children know that projections have to be headed, but have to figure out whether their language os head-initial or head-final.
LANGUAGE THEORIES ARE A FAMILY (Structural, imaginative live)???	attention shifted away from the logical problem of language *acquisition* and toward its *cousin*, the logical problem of language *evolution*

The Structural metaphor found is of the type Structural marginal

literal live: LANGUAGES ARE MOVING OBJECTS: *the speed at which* (first) languages *are acquired.*

No Identifying aspects, causes and personification metaphors were found. No structural, marginal literal live/novel metaphors were found.

Text 2.

23 samples of clauses and phrases were gathered. 19 of them (82.6%) are ontological metaphors. The most frequent type of metaphor is of the subtype Identifying aspects, with 7 instances, that is 36.84% of all the ontological metaphors. they include LANGUAGES ARE CONTAINERS: principles that were truly universal, manifest *in* all languages; LANGUAGES ARE MULTIDIMENSIONAL PLACES: *in* some languages *dimensions* like definiteness are not marked on functional items like Determiners; LANGUAGES ARE SOFTWARE: languages may differ in whether a specific *(phase-) head9* is strong *(uF-bearing)* or weak (defective); LANGUAGES ARE ENTITIES: the common impression [...] that languages *can vary* from one another indefinitely; LANGUAGES ARE NATURAL FORCES: *the types of* languages that parametric clusters

describe *act like attractors*.

6 (31.57% of all the ontological metaphors) instances of the subset of personification metaphor LANGUAGES ARE PEOPLE were found. Some examples include: all languages *make use of* the same pool features; how they *express* the relevant feature F; languages *may choose to express* f1 and f2 separately (analytically) or as a bundle (syncretically).

One instance of the metaphor LANGUAGES ARE ROADS was detected: one of the ways in which languages differ. One example of LANGUAGES ARE PLACES/ ROADS was found: anything *goes across* languages.

Finally, the four samples of structural metaphors were distributed along two metaphors of the same type: Structural, Marginal literal live: LANGUAGES ARE BUILDINGS: If these parameters are embedded in a theory of UG that is sufficiently rich in structure, then the languages that *are determined by fixing* their values one way or another will appear to be quite diverse; and, LANGUAGES ARE ROADS: the convenient appeal to a parameter whenever *two* languages *diverge*.

No identifying causes metaphors were found.

No Structural, Conceptual imaginative/live metaphors were found.

4.1.3 "FL"

FL: Text 1

30 samples were found. 77.41% of them correspond to ontological metaphors (23) and 22,58% of them with structural metaphors (7). The most frecuent type of ontological metaphor is THE FL IS AN ENTITY (BIOLOGICAL ENTITY) with 13 samples (43,33% of the total). Examples include: a discussion of the *origins of* FL would be relevant; the *emergence* of this [the FL] biological novelty (THE FL IS A BIOLOGICAL ENTITY) AND, (Identifying aspects) FL *lacks* words, but instead *possesses* lexical items. Next comes THE FL IS A SUBSTANCE metaphor, with 3 samples (3%): the faculty having emerged; the individual in which the FL *emerged*; to realistically account for its *emergence*. Then comes THE FL IS AN OBJECT metaphor with just two cases: a *picture* of the language faculty; another aspect of the FL that I have not *touched*. Next to that, there is just one instance of the metaphor THE FL IS A TOOL: the FL like the hand, the

nose, and other properties of our organism, *is put to use* in countless ways. One instance of THE FL IS A SOFTWARE (Identifying aspect) metaphor was found: what is remarkable about the FL is the fact that Merge is recursive... what makes Merge possible in the first place remains throughout a linguistic computation. to put an end to the ontological set of metaphors, finally, there is just one use of THE FL IS A BUILDING (Identifying aspects) metaphor: if the FL *is* optimally *designed*. Regarding personification, just one instance was found in THE FL IS A PERSON (DOER): Chomsky [...] has identified Merge as the most basic procedure that could yield recursive structures of the sort that the FL *makes use of*.

Figure 12

*Structural marginal literal live metaphor*s o*f FL in text 1*

THE FL IS A DOCUMENT/ BUILDING	with their emphasis on *formal/structural aspects* of the FL
THE FL IS A COMPUTER	the FL's *core function* is basically that of providing a syntax of thought
THE FL IS A SOFTWARE	the primary contribution to the structure of the FL may be the *optimization* of the C-I [sense] *interface*
THE FL IS A BUILDING	not every aspect of the FL *is fixed* once and for all

FL: Text 2

4 instances of the acronym were found. Two ontological and two structural metaphors. The two Ontological metaphors correspond with THE FL IS AN ENTITY metaphor: the problem of determining the character of the FL has been approached "from top down" ; and, (Identifying aspects) it seemed that FL must be rich, highly structures and substantially unique.

The two instances of structural metaphors are Marginal literal live: THE FL IS AN ORGANISM: In other words, there is only one syntax, fully uniform, at the heart of the FL; and, THE FL IS A BUILDING metaphor: the primary contribution to the structure of the FL may be optimization of the C-I [sense] interface.

No samples of ontological identifying causes metaphors were found.

No samples of other types of structural metaphors were detected.

4.1.4 FLN: Text 1

12 instances: 11 (91,66%) ontological and 1 (8.33%) structural. The structural marginal literal live metaphor THE FLN IS A BUILDING is a quotation from a different author: *structural details* of [the FLN] may result from preexisting details.

Figure 13
Ontological Metaphors of FLN:

THE FLN IS A SUBSTANCE (Identifying aspect)	a key *property* of the FLN is recursion
THE FLN IS AN OBJECT (Identifying causes)	*their* Faculty of Language in the Narrow Sense. *part of* the FLN. once the FLN was *in place* (different author) its presence led to modification of FLB-components
THE FLN IS AN ORGANISM	I would like to return to the process of lexicalization, the key event in the *evolution* of the FLN.
THE FLN IS AN ENTITY (Identifying aspect) (Identifying causes)	the nature of lexicalization *is crucial to* the FNL. *what distinguishes* humans from other species is the FLN. aspect of the FL is fixed once and for all.
THE FLN IS A CONTAINER (Identifying aspect)	the FLN may be *empty*
THE FLN IS A COMPUTER	the kind of mental *computation* that are distinctive of the FLN

No referential metaphors were found. No personification metaphors were found. No conceptual imaginative live/ novel were found.

FLN: Text 2. No instances of the acronym FLN were detected.

4.3.1.4 "FLB"

FLB : Text 1

3 Instances. 100% ontological metaphors. No reference metaphors were found. No Identifying causes metaphors were found. No

personification metaphors were found. No structural metaphors were found.

Figure 14

Ontological metaphors of FLB in Text 1

THE FLB IS AN ENTITY	*what* they call the Faculty of Language in the Broad sense, FLB
THE FLB IS AN OBJECT	once the FLB was *in place*, (Cause) its [the FLB] *presence* led to modifications of (THE FLB IS A MACHINE) FLB-*components*
(THE FLB IS A MACHINE)	FLB-*components*
THE FLB IS A COMPUTER (Identifying aspect)	These [...sensory-motor and at least some conceptual-intentional systems] constitute the FLB.

Text 2: No instances of the acronym were detected.

Below, Figure 7 and 8 show the perspective which is introduced by one frame. Thus, the lexical domain related to the concept LANGUAGE is constituted by a domain structured by 17 different mappings like the next one:

Figure 15

Example 1 of a frame and a mapping

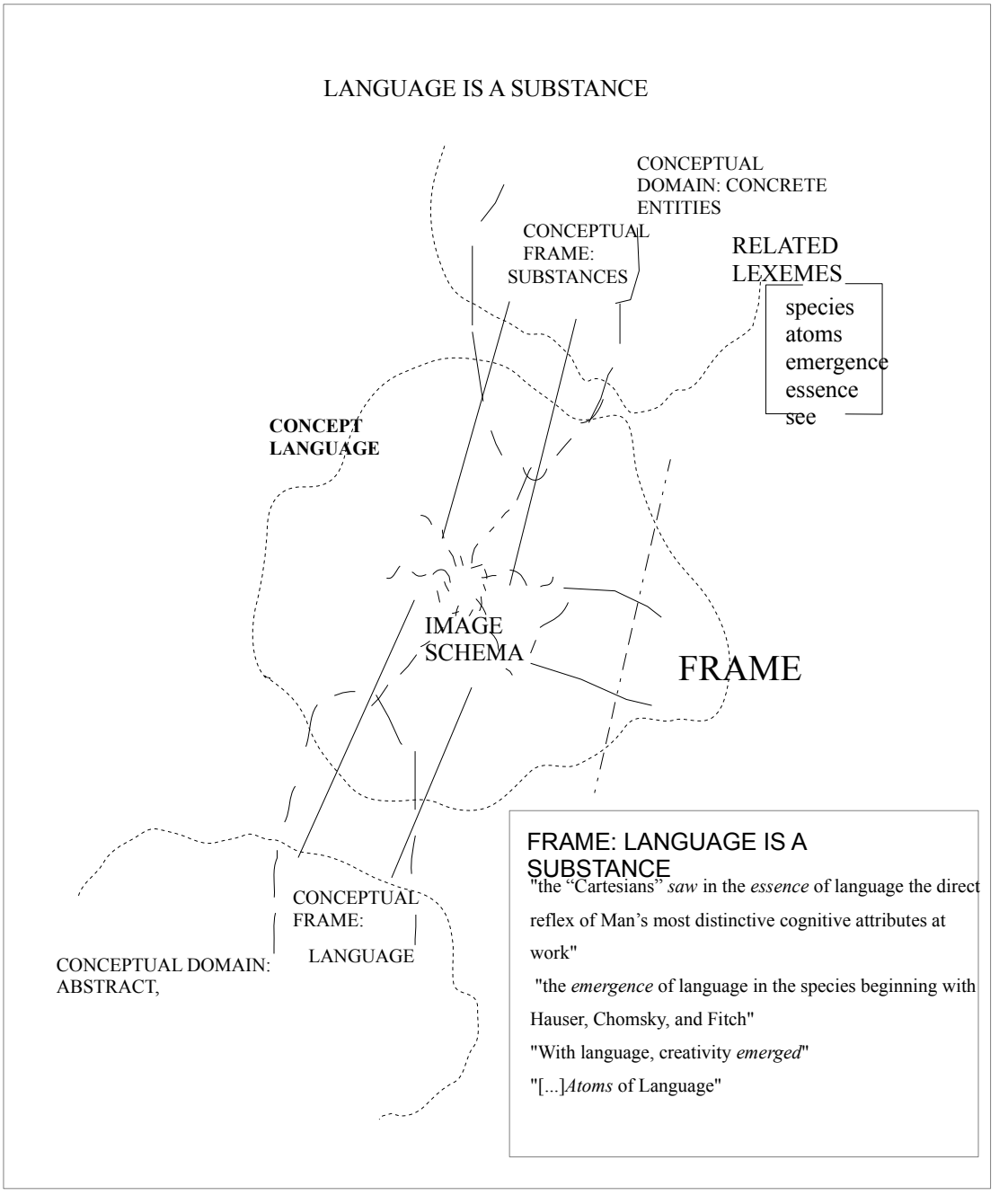
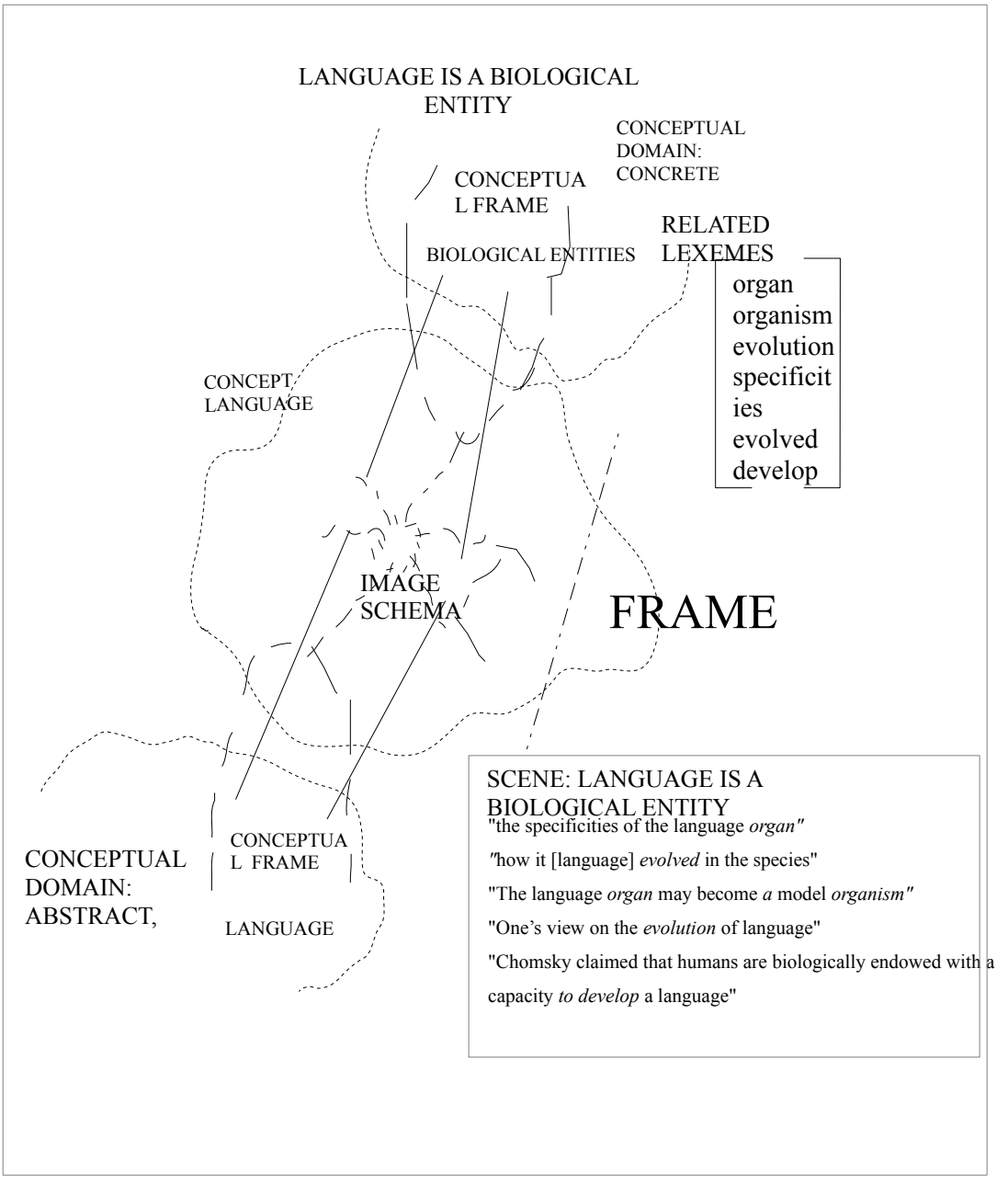


Figure 16:

Example 2 of a frame and a mapping



4.2 Observations regarding the presence of the phenomena at two levels, the subjective conceptual and conscious textual.

It is argued that the distinction introduced by Evans, V. (2014) between the conceptual and discursive level seems to find supporting evidence in the next examples.

First, it is held that the word *novelty* in T1 75. 8,5 makes specific reference to the fact that conceiving FL as a *biological entity* is not part of the way in which our conceptual system automatically processes the experiential relation maintained between the concept LANGUAGE FACULTY and BIOLOGICAL ENTITIES :the emergence of this [FL] *biological novelty* had to be facilitated.

In the next three examples we appreciate that the construction facilitated by the dash / symbol might stand as a cue for the reader to make an extra effort (and not an already existing mapped conceptualization) to be aware of the nature of the thing named as THE FL IS A DOCUMENT/BUILDING metaphor: with their emphasis on formal/

structural aspects of the FL; LANGUAGE IS A SUBSTANCE there is only language, Human, and that this organ/faculty emerged very recently in the species; and, LANGUAGE IS A SUBSTANCE/ ENTITY: this organ/faculty [LANGUAGE] emerged very recently in the species.

4.5 Observations regarding the presence of deliberate metaphors (Steen, 2011)

The author explicitly advices the reader that the source domain (keys) is being related to the target domain (concepts). The deliberate use of the parenthesis reinforces the anaphoric relation to the prior referent. Hence the analogous relation *keys = concepts* and *hole = edge feature* is made explicit: LANGUAGE IS AN OBJECT: *With* language, the human mind developed into a key ring, where all keys *(concepts)* can be combined and available at once, thanks to the hole *(edge feature)* that they all share.

In the next example the procedure is the same. The writer deliberately advices us that we have to map the fact of lexicalizing concepts with the conceptual metaphor of uprooting them: LANGUAGE IS A

PERSON (ARCHITECT/GARDENER): this ability of building bridges across modules is directly related to language, specifically the ability to lexicalize concepts *(uprooting* them from their modules) and combine them [concepts] freely via Merge.

In the next example the strategy changes. Is is argued that the cue word *like* introduces the conscious analogy between the parts of the human body which have been named: THE FL IS A TOOL: The FL, *like* the hand, the nose, and other properties of our organism, *is put to use* in countless ways

Here It is observed that something very similar happens: it is the prepositional phrase *in other words* the linguistic cue that seems to activate the fact that *FL makes a linguistic computation* (Merge). Thus the target domain FL is deliberately related to the source domain *linguistic computation:* THE FL IS A COMPUTER W*hat is remarkable and unique about the* FL [...] is the fact that Merge is recursive in other words, what makes Merge possible in the first place remains available *throughout a linguistic computation*.

4.3 Summary of figures and examples:

Ontological and structural metaphors:

	Text 1		Text 2	
	Ontological	Structural	Ontological	Structural
language	82.75%	15.51%	80%	20%
languages	75%	25%	82.6%	17.39%
FL	77.41%	22.58%	50%	50%
FLN	91.66%	8.33%	0%	0%
FLB	100%	0%	0%	0%

In the next chapter a discussion in light of the results shown above is held. It also considers the theoretical issues regarding the representation of concepts and conceptual metaphor theory as presented in the previous chapters.

CHAPTER 5: DISCUSSION

In agreement with the theory, ontological metaphor processing is by far the most common strategy to refer to the abstract concept LANGUAGE in the two texts.

According to the results, from the whole set of cognitive metaphors studied, at around 80% of them correspond to the ontological type. This figure is in agreement with the assertion made by Lakoff and Johnson (1980 and 2003) that ontological metaphors are the most frequent mental strategy to represent concepts in discourse. According to this study, then, ontological metaphor processing is the most common conceptual strategy used in these texts to refer to the concept language and the others. The other target word (languages) and acronyms (Fl, FLN, FLB) also manifest an ontological conceptual behaviour: LANGUAGES 75% and 82.6%; FL 77.41% and 50%, FLN 91,66% and FLB 100.

According to the number of times the target lexemes appear in the two texts, the manifestation of ontological metaphors seems to find a limit

at around an 80%. The less the number of manifestation of the target lexemes, the less structural metaphors there are.

Immediately below a brief narrative was made in order to picture the fact that, if conceptual metaphor theory actually is a tool to understand the way in which lexical items are related to concepts and thinking processes, then the domain in which the concepts manifest is vast. Next to that a discussion regarding the manifestation of the phenomena at two levels a conceptual subjective and a textual (more or less conscious) is held. Finally a summary with the most relevant observations is made at the end of the chapter with a depiction of the domain LANGUAGE IS.

5.1. Comprehending the scope of a domain: the lexical concept LANGUAGE.

The domain of the lexical concept LANGUAGE lacks basic orientational metaphors such as MORE IS UP (Lakoff and Johnson, 1980).

According to this study, the domain of the lexical concept LANGUAGE shows an ontological behavior (80%). The number of ontological metaphors is by far larger than for structural metaphors. According to Lakoff and Johnson, ontological metaphors are the most

important source of metaphorical conceptualization because they enable us to "specify different kinds of objects" (Lakoff and Johnson, 2003, p. 29) with an unlimited number of different aspects of our life. Therefore if we imagine language as a substance, we can see it *emerge* in the species (7.1) and see its *essence* (2.2). This thing that emerges and that has an essence, can also be appreciated as a biological entity (such as the plants that essence in made of), and thus, this image facilitates us to appreciate *its course of development* in the organism (3.2) or how *it evolved* in the species (3.3 b). As such, we can see it as an *organ* (61.8) that *may become a model organism* (71.6).

Now, if we change our perspective and imagine this organism as an object, we do not need to deal with the aspects of language that we cannot handle, and as an object, it becomes passive to the point that we can *acquire* it (5.1) and even establish a time in which we can have access to this product, the time being our *puberty* (5.1 b). As an object, the acquisition of one language, can even become *remarkable* (5.2 a), as when acquiring a precious object. We can also give an account of the state of the object so that human adults can *(tacitly) know about their* language (5.2 b)

and if they are unable to do this by their own, there is even a biological *equipment* that *makes* language *acquisition possible* (5.5).

And more characteristics are facilitated by different mappings. If we change the perspective, and the object language becomes fuzzy, we can think of it as just as an entity. As such, we can theorize about *its origin* (6.1) or discuss our *richness* and *complexity* of our human *knowledg*e of it (7.5 a) and also be aware of the limits of this thing called language and realize that the hypothesis sketched does not *cover all aspects of it* (61.2).

From the ontological point of view, a polarity is detected. In one end, when the conceptualization is made using elements of the concrete domain (such as substances, objects and concrete things) we can observe, describe and even control language. On the other hand, when the material domain does not form part of the conceptual strategy, it becomes vast and complex. The concrete aspects of language vanish and it becomes boundless and difficult to be perceived as in T1 (15) "*With* language, there is *no disparity* <u>*to speak of,*</u> only very superficial diversity". It becomes T 2 (8) the *thing* being learned even though T 2 (9) *so little is specified* about language in the genome .

The fact that just a few (no more than 5) manifestations of the LANGUAGE IS AN ORGAN metaphor highlights the absence of manifestations in which the main theme of the subfield of biolinguistics (the link between the human body and language) activates the LANGUAGE IS A BIOLOGICAL ENTITY cognitive metaphor.

Next to that, it is observed that different phrases and clauses depict different parts of the conceptual domain (LANGUAGE), which is constituted by at least 17 different conceptual representations in which each sentence introduces a specific perspective of it. This observation, then, locates the manifestation of the cognitive metaphor at the frame level. It is held, then, that each frame stands for a specific conceptual metaphor and the different subtypes introduce different scenes and perspectives of it (Fillmore, 1975 and 1982) .

Be the difference of perspectives another manifestation of different types, or the different subtypes of a type of cognitive metaphor.

According to these results, then, it is believed that examining more linguistic texts might increase both, all the types and subtypes of the types of metaphors as presented here.

5.2. Two levels of manifestation.

It is held that some of the results stand as evidence supporting the discussions that state that cognitive metaphor works at two levels (Steen , 2011; Evans, 2014): conceptual, and discursive.

Regarding cognitive metaphor theory (Evans, 2014), the mappings are activated by at least two different processes: automatic patterns of conceptualizations between different domains (such as dead and literal metaphors) and by means of a direct effort at the moment of facing linguistic input (non-recurring patterns) such as the distinction introduced by Steen, G. (2011) and Evans, V. (2014) Under this approach, Lakoff's image metaphors (1997), seem to work at the discourse level, rather than the conceptual one. Hence, it is argued that the distinction between different levels of linguistic conceptualization processes as argued by Evans (2013) should be considered regarding the issue of typology. The name cognitive metaphor seems to be broad enough to include all the levels of possible linguistic behaviour: the on-line processing at the discourse on-going level, and at the level of those conceptual manifestations already

stored as patterns in the mind (TIME IS MONEY) which find their way through and manifest at the discourse level. Next to that, it is argued that deliberate metaphors (Steen, G. 2011), stand as a subtype of discourse metaphor.

In agreement with the evidence provided so far, this study does nor assert the proposition that concepts behave like one-dimensional entities. From this point of view, it becomes difficult to support the idea that concepts can be reduced to definitions that try to equate them to just one lexical entry or to just one definition attached to them (no matter how complex this definition might appear to the naked eye). In the end, both, simple and complex sentences seem to activate only partial parts of the concepts that we perceive when making sense of linguistic cues. Reinforcing this observation, lies the fact that scientists write chapters and even whole books to develop just one concept. This study highlights the fact that concepts behave like constructions which are activated partially in agreement with the neighboring lexical items in which they appear.

For example, it is argued that the linguistic cue *acquires* activates the ontological frame OBJECT (LANGUAGE IS AN OBJECT). This part of

the concept focuses on a process in which learning a language seems to be inherent to the human condition of being a child. The way in which the word *acquires* refers to the object activates a pattern in which all the other alternatives which coexist together as a system (in the mind of the speaker) dissipate from the conscious experience of the moment in which discourse is being materialized. Hence, the fact that LANGUAGE, at the same time (this is, in the same text) "is almost surely not a natural object″ does not stand necessarily as a contradiction.

It is argued that instances of deliberate metaphors (Steen, 2011) have been found. According to Steen (2011), there is a kind of cognitive metaphor that uses a word as a cue element in the textual level that activates a conscious mapping (not deliberately creative) between two domains. We believe that at least three instances of them have been found: T1 31. 53.4 LANGUAGE IS AN OBJECT, T1 47. 49.1 LANGUAGE IS A PERSON (ARCHITECT/GARDENER) and T1 79. 61.6 THE FL IS A TOOL. They are activated by specific cue lexemes and textual symbols (parentheses). Next to that, according to Evans (2014) the mapping principles at work at the conceptual level also occur at the ongoing

discourse level. Thus the author believes that a distinction should be made regarding the categories of inter-domain mappings: those which are part of a cognitive automatic frequent stable process (i.e. conceptual metaphors) and those which are not automatic nor frequent or stable (i.e. discourse metaphors). Here we argue that Steen's deliberate metaphor (2011) is a kind of discourse metaphor. Also, we provide 4 instances in which specific textual elements might indicate a discourse rather than an automatic textual processing.

5.3 Methods change the results: a reanalysis of Lakoff and Johnson's ARGUMENT IS WAR

Even though this topic does not form part of the study, it is important in order to support the fact that the lack of systematic linguistic studies of linguistics may lead to the false assumption that the conceptual body that makes up the science of linguistics is similar among linguists.

The main difference between Lakoff and Johnson's approach (1980, 2003) and this one, is that they made use of the unilateral expert's view to detect metaphors from the corpus. Here we have tried to formalize a system in order to detect lexemes in order to highlight the metaphors in which they

are embedded. Now we are going to show a reanalysis of the ARGUMENT IS WAR metaphor. The (short) list present in Lakoff and Johnson (2003) goes like this:

ARGUMENT IS WAR

a) Your claims are indefensible.

b) He attacked every weak point in my argument.

c) His criticisms were right on target.

d) I demolished his argument.

e) I've never won an argument with him.

f) You disagree? Okay, shoot!

g) If you use that strategy, he'll wipe you out.

f) He shot down all of my arguments.

First of all, as this is a lexical approach, all the instances in which the word argument is not present, have to be left aside. Thus, sentences a), c), f) and g) cannot be analyzed according to the present system.

Now we are left only with b), d), e) and f).

b) He attacked every weak point *in my* argument.

According to this reanalysis of metaphor, the cue words *in my* refer

to an object thus, here I would propose the ontological quality of AN ARGUMENT IS A CONTAINER metaphor, and because containers are things, they can be *attacked*.

d) I *demolished* his argument.

We can literally demolish things, such as buildings or objects, so, for us, here we face the metaphor AN ARGUMENT IS A BUILDING. And buildings (kind of objects) can be demolished.

e) I've never won an argument with him.

We can win contests, games, bets and also wars. Here, for the fist time according to the way in which the analysis is carried out, we can say that this is the ARGUMENT IS WAR metaphor, and as bets, games and contests, they are process, so, for us, another entailments would also be: AN ARGUMENT IS A CONTEST/ BET/ GAME.

f) He shot down all of my arguments.

Again, we cannot literally shot arguments down, but people, animals, and things, so from our point of view, other entailments such as

ARGUMENTS ARE PEOPLE/ ANIMALS/ OBJECT would fit our interpretation of the sentences.

So, as it can be appreciated, a different analysis changes the results. If we focus our analysis on specifics lexemes and look for entailments that fit the truth conditions of the sentences literally, the metaphors will also change.

This example also stands as a proof of the claim that the same phenomena (c.f. language) can be interpreted differently due to the different metaphors and systems linguists have used to study language. Thus, the metalanguage of linguistics, or a systematic approach to study the language linguists use in linguistics, might provide light to understanding the differences on the interpretation of the same data and as an approach to study the nature of concepts and their instantiation in language.

5.4 Simple and complex cognitive metaphors.

Regarding the types of metaphor, it is argued that the taxonomy presented by Lakoff and Johnson (1980, 2003), needs to incorporate a basic distinction between *simple* and *complex* cognitive metaphors. The distinction between simple and complex derives from the use of the words when making reference to simple and complex sentences, being the main difference the number of phrasal verbs present in them. Thus, we name a

simple sentence because it is constituted by just one phrasal verb, and the complex because they posses two or more. A similar analogy -at a different level- can be done here. Compare:

T 1. 54.3 a) the kind of mind you get *when you add* language to it.

T 1 52.4 *in the context of* language, we are dealing with *a single design*, *a single organ*, in a single species

While T1 54.3 a) the metaphor that sustains is LANGUAGE IS AN INGREDIENT , what is the metaphor to sustain 52.4?

We face three options:

LANGUAGE IS A PLACE being the cue words *in the context of.*

LANGUAGE IS A BUILDING being the cue word *design* and.

LANGUAGE IS AN ORGAN being the cue word *organ.*

It is held, then, that we are dealing with two different kinds of cognitive metaphors, simple, in the first example, and complex in the second one. While simple cognitive metaphors provide just one linguistic cue element in the sentence to do the mapping, complex cognitive metaphors provide at least two different linguistic cues in the sentence to do the mapping. Compare:

T1 3.3 b) how it [language] evolved in the species

61.8 if one focuses in the language organ, I think that signs of good design emerge very quickly.

While 3.3 b) activates the LANGUAGE IS A BIOLOGICAL ENTITY metaphor unequivocally, 61.8 activates two: LANGUAGE IS AN ORGAN and LANGUAGE IS A BUILDING metaphors. It is maintained, then, that these kind of mappings can be sorted into different types at the first level (simple or complex). It is discussed then, that due to the complex nature of concepts and our conceptual system, we can make different interpretations of the same phenomena or object depending on the way in which we apply a method to observe it and the definitions we use to make a catalog of it. Compare:

T1. 71.1 a)One's view on the evolution of language depends on

71.1 b) one's view of language.

In this case, if the researcher (as it was done in this analysis) splits the sentence in two, can make a reading of two different metaphors in different context: 71.1 a) LANGUAGE IS A BIOLOGICAL ENTITY and 71.1 b) LANGUAGE IS AN ENTITY. Now it is argued that we are facing

just one kind of metaphor, a complex conceptual metaphor. That is, a frame which is construed by two source domains at the same time.

5.5 Summary of the discussion.

The domain in which the lexical concept LANGUAGE manifests is vast and presents internal contradiction: on one side it is presented as an object, in the other as an essence, an entity and some of the times as an organism. It is also presented as an ingredient, a software, a place, and as a person (a kind of organism).

Evidence suggests that the phenomena of mappings across domains also happens between different levels: subjective conceptual and more or less conscious discursive level.

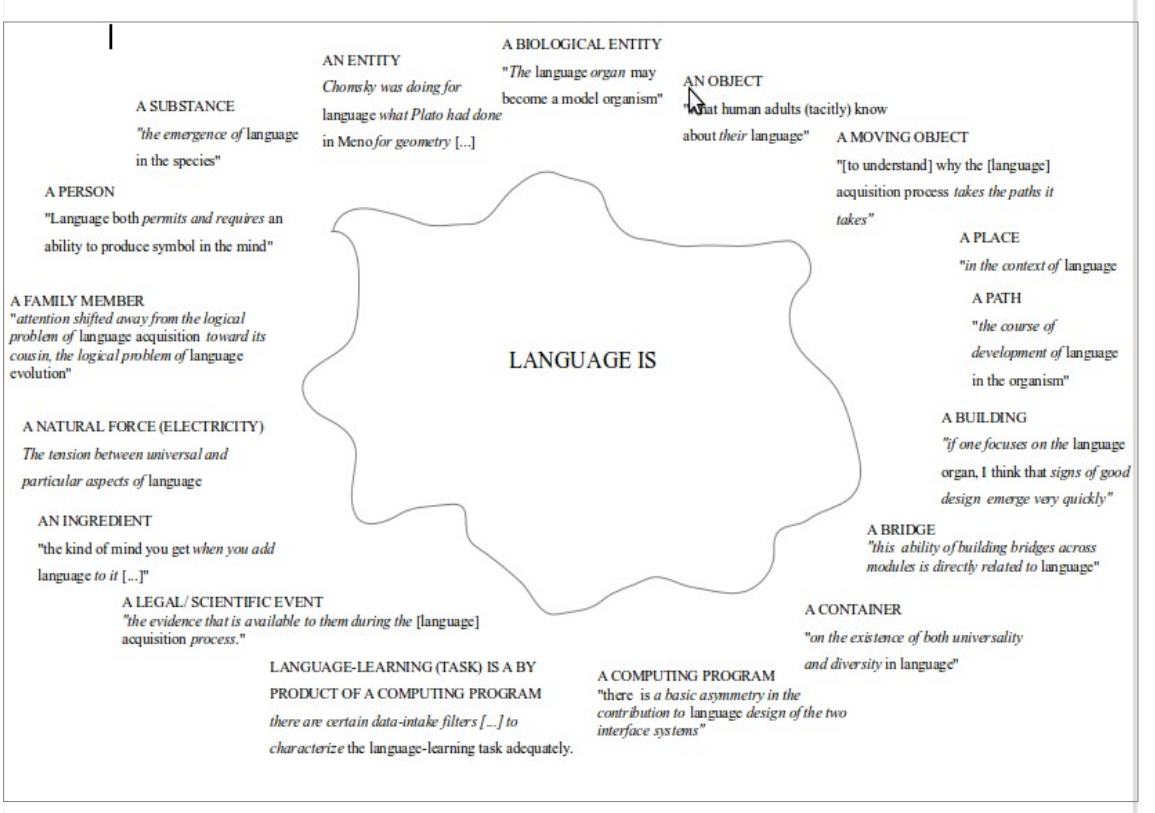
A different approach to the issue of conceptual metaphors changes the results.

The frequency of manifestation seems to be a variable related to the types of conceptual metaphors which appear. The more number of times a target linguistic cue appears, the more ontological metaphors will manifest its context. Nonetheless, the number of ontological metaphors seems to reach a limit at around 80%, but, when the number of times a lexical item

or acronym appears, decreases, it also decreases the number of structural metaphors associated to it.

Finally, we assert that the next correspondence between different concepts takes place: simple and complex sentences manifest a part of a conceptual FRAME. Simple and complex sentences which manifest by different conceptual metaphors stand as constituents of different FRAMES. All the different conceptual metaphors that a lexical concept manifests, then, represents the DOMAIN in which the concept inheres.

Figure 15:Domain of the lexical concept LANGUAGE



CHAPTER 6: CONCLUSIONS

The results obtained in this study depend on the manipulation of three independent variables. Specifically, a corpus (the lexeme language in two texts), a methodology used to gather data from a corpus (bottom-up: from the lexical level up to the phrase and clause levels) and the formal definitions used to equate the data gathered with, first, a conceptual naming process to refer to the clauses and sentences gathered, and, a taxonomy (types of conceptual metaphor) to sort them by type.

The dependent variable is the expertise of the specialist to manually detect target words (language, languages, FL, FLN, FLB), from two contexts (Text 1 and Text 2), to follow instructions to gather textual information in a matrix from the immediate context in which target words appear, and to equate that textual information with a conceptual name which allows a logical literal reading of the lexical word in context, and, a type of conceptual metaphor in coherence with the semantic function of the

conceptual metaphor (ontological, structural, novel, etc).

The most important objective of this thesis was to provide the next observation: This WORD in this phrase/ clause entails this CONCEPTUAL METAPHOR which is this TYPE OF CONCEPTUAL METAPHOR. In which the target words and acronyms (language, languages FL, FLN, FLB) correspond to an abstract concept and the words from the immediate context (phrase, clause) to concepts which inhere in concrete conceptual domains.

6.1 Summary of results

The more frequent the word or acronym appears in the text, its use seems to reach a threshold at around the 80% of ontological instances. While less appear, the tendency is to increase the frequency of ontological metaphors over the other kind of metaphors (i.e. structural). Regarding the ontological aspect of the conceptual domain LANGUAGE, in both texts it presented a similar frequency of occurrence:

- Entity substances and objects: 45.83% and 50%
- Identifying aspects: 35.5% and 40%

- Reference:12.5% and 10%
- Personification: 6,25 and 0%

For us these relations stand as observations of the system at the subjective process level. In other words, it is asserted the proposition that the presence of a threshold of 80% of ontological metaphors in the two texts is not a mark on the idiolect of the author nor a restriction due to an external variable, but that it represents the way in which the mind works.

Using the paradigm of Lakoff and Johnson (1980 and 2003), the figures correspond with the behavior of the conceptual metaphor at the subconscious level (inter-domain mappings). In that sense, the presence of ontological metaphors escapes the control of the specialist.

Up to what extent the system of metaphors observed is coherent as a whole, escapes the scope of this study. Here we cannot but make the observation that contradictory elements (LANGUAGE IS AN OBJECT and LANGUAGE IS NOT A NATURAL OBJECT) or negation do not stand as proof of contradiction in the text, but in the system as a whole.

Therefore, exploring up to what extent the different conceptual

metaphors cohere in the text as a whole might provide light in order to measure up to what extent internal contradiction must be taken as a variable for future research. In the end, this methodology observed that LANGUAGE is represented by 17 conceptual frames (i.e. cognitive metaphors) and we do not know if the text presents internal contradiction.

Regarding the process as such, the results show that some of the frames are reanalyzed by different subtypes of a type (LANGUAGE IS AN ENTITY) or even by different types (LANGUAGE IS A BUILDING) Hence, according to this study, abstract concepts manifest only partially by means of phrases and clauses.

Therefore, this study attest the cognitivist assumption that abstract concepts cannot be defined by a single proposition. Thus we argue that concepts are not partial entities as such. According to this thesis, it is the linguistic manifestation of them what makes abstract concepts instantiate only partially in discourse.

Notice that these conclusions represent the mental representation of only one author, hence, this panorama cannot be taken as representative of

the behavior of the concept LANGUAGE in linguistics nor in biolinguistics.

The changes observed in the behaviour of the mataphors and their manifestation might be the result of three variables: first, the difference of topic, internal differences due to the idiolect of the author, or, the different span of time between the two texts. The last possibility, might attest the fact that reanalysis never stops. The three variables mentioned might co-work together as a system too.

The way in which the concept LANGUAGE manifests in linguistics and in the register of linguists is not under the scope of this study. So far, a thorough picture of the form in which this phenomena manifests in linguistics does not exist. Nonetheless, an enterprise like that seems to be more than desirable if the goal is to understand the object of study and the way in which linguistics approaches to it. It is assumed that a review of other linguistic texts should reflect the overall results of this study, (same proportion of types of metaphors) and add new conceptual representations to the already observed ones. Therefore, the replication of this study,

considering a large number of different authors seems to be essential in order to track the behavior of the conceptual domain in which the concept LANGUAGE manifests. A longitudinal study along time can surely depict the way in which the perception of the object of study has changed and which parts of it have remained the same.

In agreement with the previous paragraph, the analysis of the word language in the biolinguistic subfield suggests that:

a) language as a mental construct is very complex (developed by 17 different CONCEPTUAL FRAMES) and that

b) the main concepts of linguistics should be revised using the linguistic categories made by linguists.

a) suggests that concepts cannot be described by simple definitions or a poor set of propositions. It also suggests that it may be the case that different linguistic theories or definitions may work with different parts of the object of study. Therefore, there is the possibility that the same data provides different results because of the partial nature of the linguistic manifestation of concepts in discourse.

b) stands as a consequence of a). Today we do not know if the most important definitions that make up the linguistic science make use of the same set of concepts in the same way. We also ignore whether they correspond to just a subjective inspiration due to the partial nature of linguistic representation in discourse. Nor we know if the discipline uses the same set of concepts to define its objects of study.

Regarding methodological issues, this study provides evidence to support the fact that different methods change the interpretation and the results on the same data. The main change introduced here is the lexical (bottom-up) approach and the predisposition that abstract concepts are metaphorical in nature.

Evidence to support the fact that there are simple and complex metaphorical constructions have been found. It is supported by the fact that simple metaphorical constructions have only one textual cue to indicate a mapping between domains and complex more than one.

Finally, the next generalization is proposed:

Figure 15:
Correlation of cognitive metaphors and linguistic frames.

linguistic frame = cognitive metaphor domain = n number of linguistic frames = n number of cognitive metaphors= n number of Cls and Prhs.

This correlation wants to highlight the fact that cognitive metaphors occur at the frame level, and, that each conceptual strategy is correlated to a specific set of linguistic cues which may change in time their patterns of combinations.

6.2. Limitations to the study.

As this is a study case, by no means the results can be generalized to the behavior of the lexeme to other authors, to the biolinguistic subfield or linguistics.

The assertion made here is that this thesis observes 17 different conceptual constructions of the conceptual lexeme LANGUAGE in two texts of the same author.

The model used to do this research is unable to detect the level of

coherence existing in the use of the metaphors and the overall context.

Regarding the reliability on the results as shown here, they are in agreement with the canonical literature: most of the conceptual metaphors belong to the ontological type. On the other hand, as some procedures are manual and depend on the interpretation and skill of the specialist, it is assumed that deviances may be present.

The main generalizations asserted here are that

- abstract concepts instantiate partially in language and they seem to be vast and change along time. Thus,
- definitions using a poor set of propositions, per se, will just manifest a partial view of the object being observed.

6.3. Final comment.

This study confirms the main assumption held by cognitive linguists regarding the complex nature of conceptualization. Here we argue that abstract concepts are by no means partial but that they only can be manifested partially in discourse.

As a consequence, today we simply ignore whether the most

important constructs and systems linguists use correspond to the same set of conceptual metaphors or others, therefore, the possibility to find contradictions, different results and even contradictory ideas exists. Hence, here is supported the idea that the subfield of metalinguistics might really become a linguistic tool to increase the knowledge we have concerning the science of linguistics as a theoretical construct, as an academic tradition, and, also, about the nature of the objects studied and the methods used to study them.

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APPENDIX ONE

The results of the two matrices are displayed, starting with Text N.1 and then Text N.2. The information will be shown in a list according to the types presented in Ch.2 and the lexemes under examination in the following order: language, languages, FL, FLN and FLB.

With the aim of facilitating the discussion (next chapter) correlative numbers have been assigned starting from one to both matrix 1 and 2. Thus, the number of samples of Matrix 1 (from now on M1) consists of 107 phrases, clauses or sentences and Matrix 2 (from now on M2) 52.

The first column indexes the phrases nd clauses wwith the target lexemes starting from 1. The next column shows two numbers. The first shows the paragraph number of the text and the other the sentence, hence M1 13 59.1 is read as "example 13 of Matrix 1 paragraph 59 sentence one."

4.1 Matrix 1

4.1.1 "Language"

4.1.1.1 Ontological metaphors.

- Entities, substances and objects.

LANGUAGE IS A SUBSTANCE

1.	2.2		the "Cartesians" *saw in the essence of* language the direct reflex of Man's most distinctive cognitive attributes at work
2.	7.1		and formulate informed speculations (hypotheses) concerning the *emergence of* language *in the species* beginning with Hauser, Chomsky, and Fitch [...]

LANGUAGE IS A BIOLOGICAL ENTITY

3.	3.2		to understand the *course of development of* language *in the organism*
4.	3.3	b)	and *how* it [language] *evolved in the species.*
5.	19.4	b)	*the specificities of the* language *organ*
6.	61.8		Instead, if one focuses on the language *organ,* I think that signs of good design emerge very quickly.
7.	71.6		The language *organ may become a model organism* in the context of an extended modern synthesis in biology.

LANGUAGE IS AN OBJECT

8.	5.1	a)	The central problem in generative grammar, as made explicit in Chomsky [...] is to *account for the human capacity for* language *acquisition*;
9.	5.1	b)	how any child […] *acquires at least one* language by the

time they reach puberty […]

10. 5.2 a) *The acquisition of* language is all the more remarkable when we take into account the enormous gap between
11. 5.2 b) *what* human adults (tacitly) *know about their* language
12. 5.5 *The biological equipment that makes* language *acquisition possible* is called Universal Grammar (UG).
13. 59.1 Monboddo [...] was clearly correct in his belief that language *is "necessarily connected with* an[y] inquiry into the original nature of Man."

LANGUAGE IS AN ENTITY

14. 5.7 Chomsky *was doing for* language *what* Plato *had done in Meno for* geometry and *what* the Rationalists [...] *had donef or ideas*
15. 6.1 b) see e.g. Viertel's *discussion of* Herder's *theory of* language *origin*
16. 7.5 a) Given the richness and complexity of *our human knowledge of* language,
17. 61.2 *the hypothesis* I *have sketched does not cover* all aspects of *what we would call* language,
18. 65.1 there is another aspect of the FL that I have not touched on and that *many would have regarded as central to* language (indeed *part* of the FLN) until recently, and that is *parameters.*
19. 68.1 [THIS] should enable us to not only regard the much publicized 1866 ban imposed by the Linguistic Society of Paris *on* a*ny debate concerning the origin of* language as passé,

20. 71.2 it also depends on one's view on evolution, which *too many students of* language *have* taken to be fixed along Dawkinsian lines.

LANGUAGE IS AN INGREDIENT

21. 54.3 a) the kind of mind you get *when you add* language to it is so different from

22. 54.3 b) the kind of mind you can have *without* language that calling them both minds is a mistake.

- Reference

LANGUAGE IS A CONTAINER

23. 3.6 b) *on the existence of both universality and diversity in* language

24. 7.5 d) there does not seem to be any way out of *positing some head start [...] in the* language *acquisition process.*

25. 65.7 Under most accounts [...], *phrases in natural* language are assumed to be underspecified with regard to the directionality of headedness.

LANGUAGE IS A PLACE

26. 8.8 *in the context of* language, the argument about phylogeny (Darwin's problem) recapitulates the argument about ontogeny (Plato's problem)

LANGUAGE IS A BIOLOGICAL ENTITY

27. 71.1 a) *One's view on the evolution of* language *depends on*

LANGUAGE IS AN ENTITY

28. 71.1 b) *one's view of* language.

4.1.1.1.3 Identifying aspects

LANGUAGE IS AN OBJECT

29. 5.1 The *central problem* in generative grammar, as made explicit in Chomsky [...] *is to account for* the *human capacity for* language *acquisition*;

30. 5.10 a) *attention shifted away from the logical problem of* language *acquisition and,*

31. 53.4 *With* language, the human mind *developed into a key ring*, where all keys *(concepts)* can be *combined* and available at once, thanks to the hole (edge feature) that t*hey all share.*

32. 55.1 Merge/edge features *gave Man* a *truly general* language *of thought*, a *lingua franca*, where previously there were only modular, mutually incomprehensible, dialects/ (proto-) languages of thoughts

33. 61.3 Language *is* almost surely *not a natural object.*

34. 61.4 a) It [language] *is an object of our folk psychology/biology.*

35. 61.7 b) language *is messy or klugy.*

LANGUAGE IS A SUBSTANCE

36. 52.3 *With* language, creativity *emerged*,

LANGUAGE IS A BIOLOGICAL ENTITY

37. 5.4 Chomsky claimed that humans are *biologically endowed* with *a capacity to develop* a language.

38. 5.10 b) toward its cousin*, the logical problem* of language *evolution*.

39. 3.3 a) how *core properties* of language *are implemented in* neural tissues

LANGUAGE IS AN ENTITY

40. 5.9 In the absence of some innate bias [...] *knowledge* (o*f* language, mathematics—of anything!) would never *be attained.*

41. 26.2 I will show how a specific characterization of recursion may have important consequences for another seemingly *unique and* language-*specific property of* human *cognition, the ability to build a lexicon*.

42. 59.2 *universal among modern humans,* language *is the most evident of all our uniqueness.*

43. 63.3 This is not to say that *morpho-phonology is not part of* language.

44. 64.2 b) *the size of the lexicon or some of the strategies used in its acquisition must be regarded as unique to* language (or specific to humans).

- Identifying causes

  No samples were found.

- Personification

LANGUAGE (ACQUISITION) IS A MOVING OBJECT

45. 7.6 This head start not only allows linguists to make sense of the speed at which (first) languages are acquired, but also why the [language] acquisition process *takes the paths it takes*

LANGUAGE IS A PERSON (ARCHITECT/ GARDENER)

46. 49.1 this ability *of building bridges across modules is directly related to* language, specifically *the ability to lexicalize concepts (uprooting them* from their modules) and c*ombine them* [concepts] freely *via* Merge.

47. 57.2.2 Language both *permits* and *requires an ability to produce symbol in the mind,*

4.1.1.2 Structural metaphors

- Marginal, literal live

DEVELOPMENT (OF LANGUAGE) IS A PATH

CHAIN OF MULTIPLE SIMPLE CONCEPTUAL METAPHORS

BIOLOGICAL ENTITY

LANGUAGE ACQUISITION IS A JOURNEY, LANGUAGE IS A BIOLOGICAL ENTITY, THE ORGANISM IS A ROAD

48. 3.2 to understand the *course of development of* language *in the organism*

LANGUAGE IS AN OBJECT, LANGUAGE ACQUISITION IS A BRIDGE (TO CONNECT KNOWLEDGE), KNOWLEDGE IS AN OBJECT AND

49. 5.2 a) The *acquisition of* language is *all the more remarkable* when we *take into account the enormous gap between what human* adults (tacitly) *know* about *their* language and

LANGUAGE ACQUISITION IS A LEGAL/ SCIENTIFIC PROCESS

50. 5.2 b) *the evidence* that *is available* to them during the [language] acquisition *process*.

LANGUAGE (ACQUISITION) IS A PATH

51. 7.6 b) also why the [language] acquisition process *takes the paths it takes*

LANGUAGE IS A BUILDING

52. 49.1 this ability *of building bridges across modules* is directly *related to* language [...]

53. 61.8 if one focuses on the language organ, I think that *signs of good design emerge very quickly*.

LANGUAGE IS A COMPUTING PROGRAM

54. 62.4 a) *there is a basic asymmetry in the contribution to* language *design* of the *two interface systems[...]*

- Conceptual, imaginative live /novel

LANGUAGE THEORIES ARE A FAMILY

55. 5.10 *attention shifted away from* the logical problem of language acquisition and *toward its cousin,* the logical problem *of language evolution.*

LANGUAGE IS A HEADED ORGANISM

56. 65.9 children know that projections have to be headed, but *have to figure out whether their* language *is head-initial or head-final.*

4.1.2 "Languages"

4.1.2.1 Ontological metaphors

- Entities, substances and objects

LANGUAGES ARE OBJECTS (OF KNOWLEDGE)

57. 7.5 b) *the short time it takes for children to master their* native languages,

4.1.2.1.2 Reference

LANGUAGES ARE CONTINENTS (PLACES)

58. 7.5 c) the *uniformity* displayed *within* and *across* languages during the acquisition process,

LANGUAGES ARE CONTAINERS

59. 33.1 On *the distribution of lexical material in natural* languages

- Identifying aspects

  No samples were found.

- Identifying causes

  No samples were found

- Personification

  No samples were found

4.1.2.2 Structural metaphors

- Structural, marginal, literal live

LANGUAGES ARE MOVING OBJECTS

60. 7.6 a) This head start not only allows linguists to make sense of *the speed at which (first)* languages *are acquired,*

- Structural, conceptual, imaginative live / Novel

  No samples were found.

4.1.3 "FL"

4.1.3.2 Ontological metaphors.

- Entities, substances and objects

THE FL IS A SUBSTANCE

61. 8.3 b) of the faculty [FL] *having emerged in a small group that spread*
62. 8.4 *the individual in which the* FL *emerged* must be given a head start
63. 19.5 b) that was too complex for structural constraints […] to *realistically account for its* [FL] *emergence*

THE FL IS AN ENTITY

64. 2.1 a *detailed understanding* of the human language faculty (FL) *would be critical to the development of a genuine "Science of Man."*
65. 3.1 *to reveal as accurately as possible the nature of the* FL
66. 3.5 the linguists' own *works on the nature of the* FL will be of critical importance
67. 6.1 a) *a discussion of the origin of the* FL would be relevant
68. 6.1 b) *to our understanding of the nature of the* FL
69. 6.1 d) *our notion of what the* FL *was likely to be* first had to rest on somewhat secure grounds
70. 31.2 *Word formation* [...] is as *specific and unique to the* FL as *recursion*.
71. 61.1 *The scenario I have sketched* does *not account for all aspects of the* FL
72. 62.1 *the discussion* above *has left out important aspects traditionally associated with the* FL
73. 70.2 a) Perhaps we will never know for sure whether c*ertain*

aspects of the FL *emerged*

THE FL IS A BIOLOGICAL ENTITY

74. 8.5 the *emergence* of this [FL] *biological novelty had to be facilitated*.

75. 70.2 b) it seems we can make some educated guesses about and some progress toward understanding *how the* FL *could have evolved.*

THE FL IS AN OBJECT

76. 19.5 a) The standard Principles-and- Parameters architecture, with its richly modular structure, offered *a picture of the* language faculty

77. 65.1 a) there is *another aspect of the* FL *that I have not touched on*

THE FL IS A TOOL

78. 61.6 *The* FL, like the hand, the nose, and other properties of our organism, *is put to use* in countless ways

- Ontological, reference

  No samples were found.

- Identifying aspects

THE FL IS A COMPUTER

79. 27.5 What is *remarkable and unique* about the FL [...]is *the fact that Merge is recursive* in other words, what makes Merge possible in the first place remains available throughout a *linguistic computation.*

THE FL IS AN ENTITY

80. 8.2 a) the faculty [FL] *is remarkably uniform across the species,* a fact that is most likely the result [of the faculty having emerged in a small group that spread]

81. 31.5 FL *lacks word*s, but instead *possesses lexical items*.

THE FL IS AN OBJECT

82. 20.1 the language faculty *was not shaped* b*y adaptive demands, but by physical constraints*

THE FL IS A BUILDING

83. 41.4 if the FL *is optimally designed*

- Identifying causes

  No samples were found

- Personification

THE FL IS A PERSON (AGENT, DOER)

84. 27.1 Chomsky [...] has identified Merge as the most basic procedure that could yield recursive structures of the sort that the FL *makes use of.*

4.1.3.2 Structural metaphors

- Marginal, literal live

THE FL IS A DOCUMENT/BUILDING

85. 3.6 a) with their emphasis on *formal/structural aspects* of the *FL*

THE FL IS A BUILDING

86. 8.6 a) who *take* the FL to consist of *a variety of shared cognitive structures*

87. 19.4 a) the s*tandard* Principles-and-Parameters *model of the* FL

THE FL IS A COMPUTER

88. 62.3 the FL's *core function i*s basically that *of providing a syntax of thought* [...]

THE FL IS A COMPUTING PROGRAM

89. 62.4 b) the primary contribution *to the structure* of [the] F[aculty of] L[anguage] may be *optimization of the C-I [sense] interface*.

THE FL IS A BUILDING

90. 63.5 the *syntax–phonology connection is much looser*, and *less constitutive of the* FL than *the mapping from syntax to thought*.

91. 66.2 b) *not every aspect of the* FL *is fixed once and for all*, and therefore *variation is expected.*

- Conceptual, imaginative live / novel

  No samples were found

4.1.4 "FLN"

4.1.4.1 Ontological metaphors.

- Entities, substances and objects

FLN IS A SUBSTANCE

92. 8.6 c) a *minimal amount of* genuine *novelty/specificity* (*their* Faculty of Language *in the Narrow sense*, FLN).

93. 26.1 a) The literature following Hauser et al. [...] has focused on their claim that *a key property of the* FLN is recursion

FLN IS AN ORGANISM

94. 43.1 I would like to return to the process of lexicalization, the key event *in the evolution of the* FLN,

THE FLN IS AN ENTITY

95. 64.2 *the nature of lexicalization is crucial to the* FLN,

THE FLN IS AN OBJECT

96. 65.1 c) *part of the* FLN

- Ontological, reference

  No samples were found.

- Identifying aspects

THE FNL IS AN ENTITY

97. 23.2 *what distinguishes humans from other species is the* FLN

98. 23.6.1 a) *only* the FLN is *unique to humans*

THE FNL IS A CONTAINER

99. 26.1 b) the FLN *may be empty*

THE FLN IS A COMPUTER

100. 58.2 *aspects* of Homo sapiens's tool-making *seem to require the kind of mental computation that are distinctive of the* FLN

- Identifying causes

FLN IS AN ENTITY

101. 23.5 once the FLN *was in place*, *its presence led to modifications of FLB-components.* [Hauser et al]

THE FLN IS A PAINTING (BUILDING)

102. 66.2 because the FLN *is so minimalist*, that *not every aspect of the* FL *is fixed once and for all*

- personification

  No samples were found.

4.1.4.2 Structural metaphors

- Marginal, literal live

THE FNL IS A BUILDING

103. 23.6.1 b) *structural details* of [the FLN] may result from preexisting constraints, rather than *from direct shaping by natural selection* [different writer]

- Conceptual, imaginative live / novel

  No samples were found.

4.1.5 "FLB"

4.1.5.1 Ontological metaphors.

- Entities and substances.

THE FLB IS AN ENTITY

104. 8.6 b) (*what* they call the Faculty of Language in the Broad sense, FLB)

THE FLB IS A MACHINE

105. 23.5 once the FLN *was in place*, *its presence led to modifications of FLB-components.*

- Reference

  No samples were found

4.1.5.3 Identifying aspects

THE FLB IS A COMPUTER

106. 23.4 They claim that there is evidence that other species possess *sensory–motor* and at least some *conceptual-intentional systems* similar to our own [...] These constitute the FLB

- Identifying causes

  No samples were found

- Personificatiom

  No samples were found

4.1.5.2 Structural metaphors

- Marginal, literal live

  No samples were found.

- Conceptual imaginative live / novel

  No samples were found.

4.2 Matrix 2

4.2.1 "language"

4.2.1.1 Ontological metaphors

- Entities, substances and objects.

LANGUAGE IS AN OBJECT

1.	2.6	b)	[THIS] offered a fruitful way of thinking about *how childre*n *acquire their* language

LANGUAGE IS A SUBSTANCE

2.	6.2	Chomsky outlines the Principles-and-Parameters approach that was pursued ever since and that Mark Baker articulated in a very accessible way in his *Atoms of* Language.
3.	16.6	there is only language, Human, and that *this organ/faculty emerged very recently* in the species,

LANGUAGE IS A BUILDING

4.	11.5	(suggested by the gradual abandonment of language-*specific, construction-specific rules* in favor of parametrized principles)
5.	56.4	If *we find efficient design in* language, that is a surprising empirical discovery.

LANGUAGE IS A COMPUTING PROGRAM

6.	24.5.1	*There is a basic asymmetry in the contribution to* language *design of the two interface systems* [QUOTE, CHOMSKY]

LANGUAGE IS AN ENTITY

7.	41.3	(i) a defined hypothesis space (for language, UG),
8.	50.4	some effects formerly attributed to macroparameters may be due to a very general superset bias (economy

guideline) relativized to *the thing being learned* (language).

9. 51.7 a) It is *because so little is specified about* language *in the genome*

10. 51.7 b) that the varied, and ever-changing environment gives us variation in *the externalized aspects of* language.

- Reference

LANGUAGE IS A PLACE (OF KNOWLEDGE)

11. 3.2 [THIS] *produced* some extremely interesting *results*, *in the domains of* language

LANGUAGE IS A PLACE

12. 52.4 *in the context of* language, we are dealing with a single design, a single organ, in a single species.

- Identifying aspects

LANGUAGE IS A SUBSTANCE/ ENTITY

13. 16.6 *this organ/faculty* [LANGUAGE] *emerged very recently in the species,*

LANGUAGE IS AN ENTITY

14. 25.2 *this [sound/sign] is that aspect of* language t*hat is used for communication and learning,*

15. 52.5 *With* language, *there is no disparity to speak of*, *only very superficial diversity.*

LANGUAGE IS A BUILDING

16. 52.5 b) t*here is no diversity of design in* language, as 50 years of hard work in generative grammar have revealed.

LANGUAGE IS BUSINESS

17. 46.1 *the Superset bias may reveal another economy principle at work in* language.

LANGUAGE IS A PLACE

18. 52.4 in the context of language, *we are dealing with a single design, a single organ, in a single species.*

LANGUAGE IS AN ORGAN

19. 53.3 *the formal simplicity of the* language *organ.*

20. 52.4 that in the context of language, *we are dealing with* a single design*, a single organ*, in a single species.

- Identifying causes

  No samples were found.

- Personification

  No samples were found

4.2.1.2 Structural metaphors

- Marginal, literal live

LANGUAGE IS A NATURAL FORCE (ELECTRICITY)

21. 2.6 a) The Principles-and-Parameters approach, […] enabled to resolve in a feasible way *the tension between universal* and *particular aspects* of language,

LANGUAGE (ACQUISITION) IS A PATH

22. 2.10 b) more importantly, principles whose formulations contained open values (parameters) that had to be fixed *in the course of* language *acquisition*.

LANGUAGE IS A [COMPLEX METAPHOR]

23. 52.4 *in the context of* language, we are dealing with *a single design, a single organ*, *in a single species*.

- Conceptual imaginative live / novel

LANGUAGE-LEARNING (TASK) IS A BY PRODUCT OF A COMPUTING PROGRAM

24. 42.1 *there are certain data-intake filters or certain learning biases that must be assumed to characterize the* language-*learning task* adequately.

LANGUAGE IS A BUILDING

25. 52.2 Narrow syntax sets the limits of variation *(no* language *will have ternary branching structures if binary branching is a third factor effect; ditto for minimality, the size of phases*, etc.)

4.2.2. "Languages"

4.2.2.1 Ontological metaphors

- Entities, substances and objects

LANGUAGES ARE ENTITIES

26. 3.7 *throughout the grammar of individual* languages

27. 12.2 *[HYPOTHESES] assume* languages *to be uniform, with variety restricted to easily detectable properties of utterances*

LANGUAGES ARE ROADS

28. 36.3 b) one of the ways in which languages differ

LANGUAGES ARE OBJECTS

29. 7.2 where the acquisition task is reduced to *choosing one among all the fully formed* languages *that UG makes available.*

30. 40.4 *as the child acquires her* language,

- Reference

LANGUAGES ARE PLACES

31. 52.1 *anything goes across* languages

- Identifying aspects

LANGUAGES ARE CONTAINERS

32. 2.10 a) *principles that were truly universal, manifest in all* languages,

33. 16.2 *a principle like 'Shortest Move' could be active in some* languages, but *not in* others.

34. 30.5 *in* some languages *movement is* overt, while in others it is covert.

LANGUAGES ARE MULTIDIMENSIONAL PLACES

35. 30.2 that *in some* languages *dimensions like* definiteness are not marked on functional items like Determiners.

LANGUAGES ARE COMPUTING PROGRAMS

36. 36.7 languages *may differ* in *whether a specific (phase-)head9 is strong (uF-bearing) or weak (defective).*

LANGUAGES ARE ENTITIES

37. 39.4 the common impression […] that languages *can vary from one another indefinitely*,

LANGUAGES ARE NATURAL FORCES

38. 40.4 a) *the types of* language that parametric clusters describe a*ct as attractors*

- Identifying causes

  No samples were found.

- Personification

LANGUAGES ARE PEOPLE

39. 36.3 a) all languages *make use of the same pool of features,*
40. 36.3 c) how they [languages] *express the relevant feature F*.
41. 36.4 languages *may choose to express* f 1 and f 2 separately (analytically) or as a bundle (syncretically).
42. 39.5 a) Some languages indeed *appear to display the clusters the theory predicted*
43. 39.5 b) many languages *display only a few of the predicted clustering effects*;
44. 39.5 c) more often than not, languages *show no clustering effects whatsoever*.

4.2.2.2 Structural metaphors

- Marginal, literal live

LANGUAGES ARE BUILDING MATERIALS

45. 6.6 *If these parameters are embedded in a theory of UG that is sufficiently rich in structure, then the* languages *that are determined by fixing their values* one way or another will appear to be quite diverse

LANGUAGES ARE BUILDINGS

46. 13.3 In other words, there is only one syntax, fully uniform, at the heart of the faculty of language [FL],

underlying all languages.

LANGUAGES ARE ROADS

47. 37.1 *there are more ways in which* languages *may differ,*

48. 49.1 one finds relatively little explicit discussion of parametric variation in the Minimalist literature (other than the convenient appeal to a parameter whenever *two* languages *diverge*),

- Conceptual, imaginative live/ novel

No samples were found.

4.2.3 "FL"

4.2.3.1 Ontological metaphors

- Entity, substances and objects

THE FL IS AN ENTITY

49. 10.2 a) *the problem of determining the character of* FL has been approached "from top down" [Chomsky]

- Reference

No samples were found

- Identifying aspects

THE FL IS AN ENTITY

50. 6.8 it seemed that FL *must be rich, highly structured, and substantially unique*

- Identifying causes

No samples were found

- Personification

  No samples were found

4.2.3.2 Structural metaphors

- Marginal, literal live

THE FL IS A LIVING ORGANISM

51. 13.3 *In other words, there is only one syntax, fully uniform, at the heart of the* faculty of language [FL], underlying all languages.

THE FL IS A BUILDING

52. 24.5.1 b) the primary contribution to the structure of [the] F[aculty of] L[anguage] may be optimization of the C-I [sense] interface. [Chomsky]

- Conceptual, imaginative live/ novel

  No samples were found

4.2.4 "FLN"

No samples were found.

4.2.5 "FLB"

No samples were found.

APPENDIX 2

Text 2

Discourse medium: Written

Register: Academic, paper. Subfield of biolinguistics

Text: Some Reflections on Darwin's Problem in the Context of Cartesian Biolinguistics

Author: Cedric Boeckx

Target lexeme(s): language, FL (faculty of language), FLN, FLB

P	S	Sentences	Clauses and phrases	Salient attribute	Linguistic metaphor	Type
1/ p 42	1	3.1 Darwin's Problem and Rationalist Commitments				
2/ p 42-43	1	Already in the early days of modern science (seventeenth and eighteenth centuries) it was clear to natural philosophers like Descartes, Hobbes, Humboldt, and Hume that a detailed understanding of the human language faculty (FL) would be critical to the development of a genuine "Science of Man."	that a *detailed understanding* of the human language faculty (FL) would be *critical* to *the development* of a *genuine* "Science of Man."	+object +part (of science of man) +critical (most important) +substance +embodied +essence +reflexive +(most important) cognitive attribute +active (at work)	THE FL IS AN OBJECT (OF KNOWLEDGE) LANGUAGE IS A SUBSTANCE THE ESSENCE (OF LANGUAGE) IS A PLACE THE ESSENCE OF LANGUAGE IS A MIRROR LANGUAGE IS A COGNITIVE ATTRIBUTE COGNITIVE ATTRIBUTES ARE (PARTS OF) A MACHINE	Ontological, entity Ontological, substance Ontological, reference Ontological, identifying aspects Ontological, entity
	2	As Chomsky has remarked on numerous occasions (see Chomsky 1965, 1966, 1972b), the "Cartesians" saw in the essence of language the direct reflex of Man's most distinctive cognitive attributes at work—most prominent among which the unbounded creativity that is	the "Cartesians" *saw in* the *essence* of language the direct *reflex* of Man's most distinctive *cognitive attributes at work*|			Structural,

		so unique to us. Under Chomsky's impetus modern linguistics has recaptured the central themes of the first cognitive revolution and is now a core area of modern cognitive science, a branch of biology. It is in order to emphasize the true nature of this research program that linguists of a generative orientation have begun to use the term "Biolinguistics," a term first used with this intention by Massimo Piattelli- Palmarini at a meeting in 1974.				marginal, literal live
3/ p 43-44	1 2 3 4 5	The immediate aim of biolinguistics is still to reveal as accurately as possible the nature of the FL, but biolinguistic inquiry does not stop there. It also seeks to understand the course of development of language in the organism and the way it is put to use once it has reached its mature state; in particular, how linguistic form may give rise to meaning. Ultimately, biolinguists hope to contribute to our understanding of how core properties of language are implemented in neural tissues and how it evolved in the species. These last two tasks have an obvious interdisciplinary character, requiring linguists to join forces with psychologists, biologists, philosophers, and so on. I firmly believe that the linguists' own works on the nature of the FL will be of critical importance in the formulation of detailed hypotheses to be tested at different levels of scientific analysis.	to *reveal* as accurately as possible *the nature* of the FL to understand the *course* of *development* of language *in the organism* how *core properties* of language *are implemented in* neural tissues and how it [language] *evolved in* the species. that the linguists' own *works on the nature* of the FL will be of critical importance with their emphasis on *formal/structural aspects* of the *FL* and on *the existence of* both *universality* and	+entity +hidden nature +entity +biological +develops +contained (in organism) +entity +parts (central, most important) +passive +active +evolution +nature +embodied +form +structure +aspects +universal +diverse	THE FL IS AN ENTITY THE NATURE OF FL IS HIDDEN LANGUAGE IS A BIOLOGICAL ENTITY (INSIDE HUMANS) (EMBODIED) HUMAN BODY IS A PLACE DEVELOPMENT (OF LANGUAGE) IS A PATH LANGUAGE IS A SUBSTANCE PROPERTIES ARE PARTS OF AN OBJECT NEURAL TISSUES IS A PLACE LANGUAGE IS A BIOLOGICAL ENTITY SPECIES IS A PLACE THE FL IS AN ENTITY THE NATURE OF FL IS AN OBJECT THE FL IS A BUILDING	Ontological, entity Ontological, entity Ontological, entity Ontological, reference Structural, marginal, literal live Ontological, entity Ontological, entity Ontological, reference Ontological, entity Ontological, reference Ontological, entity Ontological, entity Structural, marginal, literal live

	6	Furthermore, with their emphasis on formal/structural aspects of the FL and on the existence of both universality and diversity in language, biolinguists also hope to contribute significantly to the emergence (currently underway) of an expanded modern synthesis in biology, about which I will have more to say in this chapter.	*diversity in language*		LANGUAGE IS A PLACE	Ontological, reference
4/ p 44	1	3.1.1 The conceptual relationship between Plato's Problem and Darwin's Problem				
5/ p44	1	The central problem in generative grammar, as made explicit in Chomsky (1965: ch. 1), is to account for the human capacity for language acquisition; how any child, short of pathology or highly unusual environmental circumstances, acquires at least one language by the time they reach puberty (at the very latest) in a way that is remarkably uniform and relatively effortless.	The *central problem* in generative grammar, as made explicit in Chomsky [...] is to *account for* the *human capacity* for *language acquisition*; how any child […] *acquires* at least *one language* by the time they reach puberty […]	+hierarchies +capacity (human) +acquisition +several +passive +remarkable +possession +passive	PROBLEMS ARE ENTITIES IN A PLACE GENERATIVE GRAMMAR IS A PLACE LANGUAGE ACQUISITION IS A PROBLEM LANGUAGE IS AN OBJECT LANGUAGE IS AN OBJECT GROWING IS A ROAD PUBERTY IS A PLACE LANGUAGE IS AN OBJECT (COMMODITY)	Ontological, entity Ontological, reference Ontological, identifying aspects Ontological, entity Ontological, entity Structural, conventional, literal live Ontological, reference
	2	The acquisition of language is all the more remarkable when we take into account the enormous gap between what human adults (tacitly) know about their language and the evidence that is available to them during the acquisition process.	The *acquisition* of *language* is all the *more remarkable* when we take into account *the* enormous *gap* between what *human* adults (tacitly) *know* about *their* language and *the evidence* that *is available* to them during the *acquisition process*.	+process +passive +entity +passive	LANGUAGE ACQUISITION IS A BRIDGE LANGUAGE IS A POSSESSION LANGUAGE ACQUISITION IS A (LEGAL/ SCIENTIFIC) PROCESS	Ontological, entity Structural, conventional, literal live Ontological, entity Structural, marginal, literal live
	3	It should be obvious to anyone that the linguistic input a child receives is radically impoverished and extremely fragmentary.		+passive		
	4	It is in order to cope with this "poverty of stimulus" that Chomsky claimed that humans are biologically endowed with a capacity to develop a language.	Chomsky claimed that humans are *biologically endowed* with *a capacity* to *develop* a language.	+passive	LANGUAGE IS AN ENTITY LANGUAGE DEVELOPMENT IS A BIOLOGICAL CAPACITY	Ontological, entity Ontological, identifying aspects

	5	The biological equipment that makes language acquisition possible is called Universal Grammar (UG).	The *biological equipment* that *makes language acquisition possible is* called *Universal Grammar (UG)*.		LANGUAGE ACQUISITION IS AN OBJECT UG IS A MACHINE	Ontological, entity Structural, conventional, literal live
	6	In positing UG, Chomsky was doing what ethologists like Lorenz and Tinbergen had been led to do to account for the range of highly specific behaviors that many animals display.			LANGUAGE IS AN ENTITY LIKE (GEOMETRY, IDEAS)	Ontological, entity
	7	At a more general level, Chomsky was doing for language what Plato had done in Meno for geometry and what the Rationalists (Descartes, Leibniz, etc.) had done for ideas more generally.	Chomsky *was doing for* language what Plato *had done in Meno for* geometry and what the Rationalists [...] had done for *ideas*	+dependency +logical problem: acquisition evolution +cousin		
	8				LANGUAGE IS AN OBJECT (OF KNOWLEDGE)	Ontological, identifying aspects
	9	All of them were making it possible in principle for information to be gathered from experience (i.e. for learning to take place).	*In the absence of* some innate *bias [...] knowledge* (*of language,* mathematics—of anything!) would never *be attained.*		LANGUAGE IS A PROBLEM (OF LOGIC/ EVOLUTION)	Ontological, identifying aspects
	10	In the absence of some innate bias toward interpreting incoming data in specific ways, knowledge (of language, mathematics—of anything!) would never be attained.6			LANGUAGE CATEGORIES ARE A FAMILY LANGUAGE IS A BIOLOGICAL ENTITY	Structural, conceptual imaginative live Ontological, identifying aspects
		As the structure of UG became clearer in the Principles-and-Parameters era, attention shifted away from the logical problem of language acquisition and toward its cousin, the logical problem of language evolution.	*attention <u>shifted</u> away from the logical problem of language acquisition and <u>toward its cousin</u>,* *the logical problem* of language *evolution.*			
6 / p 45	1	It was already evident to the Rationalists that a discussion of the origin of the FL would be relevant to our understanding of the nature of the FL (see e.g. Viertel's discussion of Herder's theory of language origin	that *a discussion* of the *origin* of the *FL* would be *relevant* to our understanding of the *nature* of the FL	+origin +importance +nature	THE FL IS AN ENTITY	Ontological, entity

		(Viertel 1966)—after all, any investigation into the emergence of some faculty x depends on specific hypotheses regarding what x is —but our notion of what the FL was likely to be first had to rest on somewhat secure grounds to prevent evolutionary scenarios from being more than fanciful just-so stories.	see e.g. Viertel's discussion of Herder's *theory* of language *origin* but <u>our notion</u> of *what* the FL *was* likely to *be* first *<u>had to rest on</u>* <u>somewhat secure</u> *<u>grounds</u>* to prevent evolutionary scenarios from being more than fanciful just-so stories	+origin + entity Ejemplo de deliberate metaphor	LANGUAGE IS AN ENTITY FL IS AN ENTITY THEORIES ARE BUILDINGS	Ontological, entity Ontological, entity Structural, literal live
7/ p 45	1 2 3 4 5 6 7	Once linguists felt the foundations were solid, they indeed began to approach UG "from below," and formulate informed speculations (hypotheses) concerning the emergence of language in the species, beginning with Hauser, Chomsky, and Fitch (2002). In the preceding paragraph I referred to Darwin's Problem as the cousin of Plato's Problem. This is because the logical structure of Darwin's Problem turns out to be very similar to that of Plato's Problem. Both revolve around a Poverty of Stimulus situation. In the context of Plato's Problem, the argument goes like this: Given the richness and complexity of our human knowledge of language, the short time it takes for children to master their native languages, the uniformity displayed within and across languages during the acquisition process, and the poverty of the linguistic input to children, there does not seem to be any way out of positing some head start (in the guise of some innate component, UG) in the language acquisition process. This head start not only allows	and formulate informed speculations (hypotheses) concerning the *emergence* of language *in the species*, beginning with Hauser, Chomsky, and Fitch (2002) Given the richness and complexity of *our* human *knowledge* of language, the *short time* it *takes for children* to *master their* native languages, the *uniformity* displayed *within* and *across* languages *during* the *acquisition process*, [...] there does not seem to be any <u>way out of positing some head start</u> (in the guise of some innate component, UG) *<u>in</u>* <u>the language acquisition</u> *<u>process.</u>* This head start not only allows linguists	+emerge +in species +rich +complex +native +complex +uniform +process +process +speed +active +passive	LANGUAGE IS A SUBSTANCE THE SPECIES IS A PLACE LANGUAGE IS AN ENTITY KNOWLEDGE IS AN OBJECT LANGUAGES ARE AN OBJECT (OF KNOWLEDGE) TIME IS HEIGHT LANGUAGES ARE CONTINENTS (PLACE) LANGUAGE ACQUISITION IS A PLACE LANGUAGES ARE MOVING OBJECTS LANGUAGE IS A PERSON LANGUAGE ACQUISITION IS A PATH	Ontological, substance Ontological, reference Ontological, entity Ontological, entity Ontological, entity Orientational Ontological, reference Ontological, reference Structural, marginal, literal live Ontological, personification Structural,

		linguists to make sense of the speed at which (first) languages are acquired, but also why the acquisition process takes the paths it takes (as opposed to the paths it could logically take). By minimizing the role of the environment, UG allows us to begin to grasp how Plato's Problem could be solved.	to make sense of *the speed* at which (first) languages are acquired, but also why the acquisition process *takes the paths it takes*			marginal literal live
8/ p 46	1	Similarly, when it comes to Darwin's Problem, everyone seems to grant that the FL emerged in the species very recently (within the last 200,000	everyone seems to grant that the FL *emerged in the species* very recently	+emerge +recently +active	THE FL IS A SUBSTANCE THE SPECIES IS A PLACE	Ontological, substance Ontological, reference
	2	years, according to most informed estimates). Everyone also seems to grant that this was a one-time event: the faculty is remarkably uniform across the species, a fact	the faculty is remarkably uniform *across the species*, a fact that is most likely the result	+uniform +emerge +active	THE FL IS AN ENTITY THE SPECIES IS A PLACE	Ontological, entity Ontological, reference
	3	that is most likely the result of the faculty having emerged in a small group that spread (Homo sapiens).	of the faculty having emerged in a small group that spread	+emerge (extremely recent)	THE FL IS A SUBSTANCE THE FL IS A SUBSTANCE	Ontological, substance
	4	In light of the extremely recent emergence of the FL, one ought to welcome a hypothesis that minimizes the role of the environment (read: the need for	In light of the extremely recent *emergence* of the FL, one ought to welcome a hypothesis that	+emerge +singular	THE FL IS A SUBSTANCE THE INDIVIDUAL IS A PLACE	Ontological, substance
	5	several adaptive steps), and, more generally, one that minimizes what had to evolve.	the *individual in* which the FL *emerged* must be given a head start	+biological +novelty +passive		Ontological, substance Ontological, reference
	6	Just as in the context of Plato's Problem, the individual in which the FL emerged must be given a head start: the key evolutionary event must be assumed to have		+shared +several cognitive structures +FLB	THE FL IS A BIOLOGICAL SUBSTANCE	Ontological, substance
	7	been small, and many cognitive structures available to our ancestors must have been recruited (with minimal modifications, to avoid the need for many adaptive steps).	the *emergence* of this [FL] *biological novelty had to be facilitated*.	+minimal amount +novelty +specificity	THE FL IS A BUILDING COGNITIVE FACULTIES ARE OBJECTS THE FLB IS AN ENTITY	Structural, marginal, literal live
	8	In Kirschner and Gerhart's (2005) terms, the emergence of this biological novelty had to be facilitated. As far as I can see, this is exactly the logic laid out in Hauser, Chomsky, and Fitch (2002), who take the FL to consist of a variety of shared cognitive	who *take* the FL to consist of *a variety of shared cognitive structures* (what they call the Faculty of Language in the Broad sense, FLB) and a *minimal amount of*	+context	THE FLN IS A SUBSTANCE THEORIES ARE OBJECTS (COMMODITIES)	Ontological, entity Ontological, entity Ontological, substance Structural,

		structures (what they call the Faculty of Language in the Broad sense, FLB), and a minimal amount of genuine novelty/specificity (their Faculty of Language in the Narrow sense, FLN). My point in this section is that this sort of evolutionary scenario makes a lot of sense once we recognize the similarity between the logic of Darwin's Problem and that of Plato's Problem. (I guess one could say that in the context of language, the argument about phylogeny (Darwin's problem) recapitulates the argument about ontogeny (Plato's problem).)	genuine *novelty/specificity* (*their* Faculty of Language *in the Narrow sense*, FLN). *in the context* of language, the argument about phylogeny (Darwin's problem) recapitulates the argument about ontogeny (Plato's problem)		LANGUAGE IS A PLACE ARGUMENTS RECAPITULATE (OTHER) ARGUMENTS	marginal, literal live Ontological, reference Ontological, personification, cause of
9/ p 46		3.1.2 (Neo-)Cartesian linguistics meets (neo-)rationalist morphology				
10/ p 46	1 2 3 4 5 6	It is customary to allude to Theodor Dobzhansky's well-known dictum that "nothing makes sense in biology except in the light of evolution" whenever questions of origin are raised (Dobzhansky 1973). The exquisite complexity of organisms can only be accounted for, so it seems, by means of natural selection. As Dawkins (1996: 202) puts it, "whenever in nature there is a sufficiently powerful illusion of good design for some purpose, natural selection is the only known mechanism that can account for it." Questions of origin pertaining to the mind, the "Citadel itself," as Darwin called it, are no exception. Indeed, the assumption that natural selection is the "universal acid" (Dennett 1995) is perhaps nowhere as strong as in the study of mental faculties, being the motto (credo?) of				

		evolutionary psychology (witness Pinker 1997, Marcus 2008). But the simplicity of Dobzhansky's assertion conceals layers of necessary refinements that cannot be ignored. Its meaning very much depends on what it means to make sense of life (including mental life), and what we understand by (Darwinian) evolution.				
11/ p 47	1 2 3 4 5 6 7 8 9 10 11	As Fox-Keller has made clear in her book Making Sense of Life (Keller 2002), the notion of explanation, of "making sense of life," cannot be uniformly defined across the life sciences. As for Darwinian evolution, Gould, more than anyone else, has stressed the richness and complexity of evolutionary theory (see Gould 2002), and stressed the limitations of ultra-Darwinism and its narrowly adaptationist vision. One can, and must, preface any study of origin by "ever since Darwin," not, I think, by "ever since Dawkins." And one must bear in mind that Darwin himself was explicit about the fact that "natural selection is . . . not [the] exclusive means of modification" (Darwin 1859: 6) There are signs that the tide is changing. The promises of genome sequencing, and of the selfish gene, have not been met, and a growing number of biologists side with Lynch's (2007) opinion that "many (and probably most) aspects of genomic biology that superficially appear to have adapative roots . . . are almost certainly also products of non-adaptive processes." Speaking for all evo–devo adherents, Carroll (2005a) points out that the modern synthesis has not given us a theory of form. A theory of form is at the leart [sic] of what Kirschner and Gerhart call "Darwin's				

		Dilemma." When Darwin proposed his theory of evolution, he relied on two ingredients: variation and selection. Although he could explain selection, he could not explain variation. The forms on which selection operated were taken for granted. Since The Origin of Species, at repeated intervals, and with accelerated pace in recent years, it has been suggested that several factors giving direction to evolution (facilitating variation, biasing selection, etc.) must be taken into account.				
12/ p 47	1 2 3	As Gould (2002: 347) clearly states, simple descent does not solve all problems of "clumping" in phenotypic space; we still want to know why certain forms "attract" such big clumps of diversity, and why such large empty spaces exist in conceivable, and not obviously malfunctional, regions of potential morphospace. The functionalist and adaptationist perspective ties this clumping to available environments, and to shaping by natural selection. Structuralists and formalists wonder if some clumping might not record broader principles, at least partly separate from a simple history of descent with adaptation principles of genetics, of development, or of physical laws transcending biological organization.				
13/ p 48	1	In this respect Gould (2002: 21) calls for a renewed appreciation for "the enormous importance of structural, historical, and developmental constraints in channeling the pathways of evolution, often in highly positive ways, adding that "the pure functionalism of a strictly Darwinian (and externalist) approach to				

		adaptation no longer suffices to explain the channeling of phyletic directions, and the clumping and inhomogenous population of organic morphospace."				
14 /p 48	1 2 3	Echoing Gould, Pigliucci (2007) writes that biology is in need of a new research program, one that stresses the fact that natural selection may not be the only organizing principle available to explain the complexity of biological systems. It is not just all tinkering; there is design too. Pigliucci (2007) reviews numerous works that provide empirical evidence for non-trivial expansions of the modern synthesis, with such concepts as modularity, evolvability, robustness, epigenetic inheritance, and phenotypic plasticity as key components.				
15 /p 48	1 2 3 3.1	Amundson (2005) points out correctly that many of the themes at the heart of the expanded modern synthesis (a more enlightened version of Darwinian evolution) hark back to all the major theorists of life before Darwin, especially those that are often called the Rationalist Morphologists. All major theories of life before Darwin followed a tradition reaching back to Plato in presenting a fundamentally "internalist" account, based upon intrinsic and predictable patterns set by the nature of living systems for development through time, as the term "evolution" (evolutio, "unfolding") reveals. As one of the foremost exponents of such internalist accounts, and the person who coined the term "morphology," Goethe writes (second essay on plant metamorphosis, written in 1790): In my opinion, the chief concept underlying all observation of life—one from which we must not deviate—is that a creature is self-sufficient, that its parts are inevitably				

		interrelated, and that nothing mechanical, as it were, is built up or produced from without, although it is true that the parts affect their environment and are in turn affected by it.				
16/ p 48-49	1 2 3 4 5 5.1 5.2 5.3 5.4 5.5 5.6	By analogy with Chomsky's distinction between I(nternalist)-linguistics and E(xternalist)-linguistics introduced in Chomsky (1986), we could call the modern synthesis E-biology and the return to pre-Darwinian concerns, I-biology. As a common thread, internalist accounts deny exclusivity to natural selection as the agent of creativity, viewing "adaptation as secondary tin- kering rather than primary structuring" (Gould 2002: 290). Internalists claim a high relative frequency of control by internal factors, emphasizing notions like Unity of Type and Correlation of growth. At the heart of internalist frustrations is the linkage between natural selection and contingency. In the words of Kauffman (1993: 26): We have come to think of selection as essentially the only source of order in the biological world. It follows that, in our current view, organisms are largely ad hoc solutions to design problems cobbled together by selection. It follows that most properties which are widespread in organisms are widespread by virtue of common descent from a tinkered-together ancestor, with selective maintenance of useful tinkerings. It follows that we see organisms as overwhelmingly contingent historical accidents, abetted by design. My own aim is not so much to challenge as to broaden the neo-Darwinian tradition. For, despite its resilience, that tradition has surely grown without attempting to integrate the ways in which simple and complex systems may spontaneously exhibit order.				
17/ 49	1	Despite the fact that various biologists have complained that phrases like "adaptation to the edge of chaos," and "order for free," repeatedly used by Kauffman, Goodwin, and other				

		proponents of Neo-rationalism in biology, lack clear scientific definition and operational utility, Gould (2002: 1213) argues that Kauffman et al. are groping toward something important, a necessary enrichment or broadening of biology, with important implications.				
18/ 49	1 2 3 4 5 6	Of great significance is the fact that the concerns that animate the return to the insights of the Rationalist Morphologists are the very same concerns that animate research in (Cartesian) biolinguistics. By using Cartesian Biolinguistics I intend to point to an important distinction within those who conceive of linguistics as a branch of biology (at a suitable level of abstraction). I suspect that most biolinguists make the very same "bet" that Dawkins does,11 and privilege adapation as the sole source or order and complexity. Let us call them neo-Darwinian biolinguists (see Givón 2002, Marcus 2008). By contrast, those that I would call Cartesian biolinguists follow Chomsky in (i) favoring internalist explanations, (ii) seeing design and topology where others would see tinkering, and (iii) focusing on Form over Function.12 Indeed, once the complexity of biology as a whole, and evolutionary biology in particular, is clear, any perceived conflict between "Chomsky and Darwin" (Dennett 1995), or any need to reconcile them (Calvin and Bickerton 2000), quickly evaporates.				
19/ 49-50	1 2	As a matter of fact, once the richness of evolutionary biology is taken into consideration, it seems to me that one can begin to approach Darwin's problem with some optimism toward its resolution.				

	3 4 5	I am here relying on the fact that a neo-Darwinian view of the type advocated by Pinker and Bloom (1990) still strikes me as hopeless, as Piattelli-Palmarini (1989), and more recently, Uriagereka (1998) and Lorenzo and Longa (2003), have made clear. But it is fair to say that the alternative, neo-rationalist scenario was hard to entertain until the advent of the minimalist program in linguistic theory. As I discussed in Boeckx (2006: ch. 4), the standard Principles-and-Parameters model of the FL focused on the specificities of the language organ, and made it very unlikely that central linguistic concepts such as c-command, government, empty categories, and cyclicity, just to name a few, may have emerged from any sufficiently general theory of form. The standard Principles-and-Parameters architecture, with its richly modular structure, offered a picture of the language faculty that was too complex for structural constraints (of the n sort explored by D'Arcy Thompson) to realistically account for its emergence.	the *standard* Principles-and-Parameters *model of* the FL *focused on* t*he specificities of the* language *organ* The standard Principles-and-Parameters architecture, with its *richly modular structure*, *offered a picture* of the language faculty that *was too complex* for *structural constraints* […] to *realistically* account for *its* [FL] *emergence*	+model +specificities +organ +complex (too) +emergence +active	THE FL IS A MODEL (STANDARD) THEORIES ARE PEOPLE THEORIES ARE PEOPLE LANGUAGE IS AN ORGAN THE FL IS AN ENTITY PRINCIPLES-AND-PARAMETERS IS A BUILDING PRINCIPLES-AND-PARAMETERS IS A PERSON THE FL IS A SUBSTANCE	Structural, marginal, literal live Ontological, personification Ontological, personification Ontological, entity Ontological, entity Structural, marginal, literal imaginative Ontological, personification Ontological, substance
20/ 50	1 2	Put differently, the idea that the language faculty was not shaped by adaptive demands, but by physical constraints ("Turing's thesis," as Chomsky sometimes calls it)—a recurring theme in Chomsky's writings (see Jenkins 2000, Otero 1990, for relevant citations)—did not fit snugly in past frameworks. It found its niche only recently, as part of the Minimalist Program for linguistic theory, in the same way that the pre-Darwinians' speculations about a general theory of biological form seem to be finding their niche in the extended modern synthesis advocated by a growing number of biologists.	that the language faculty *was* not *shaped* by *adaptive demand*s, but by *physical constraints*.	+shape +physical constraints +passive	THE FL IS AN OBJECT PHYSICAL CONSTRAINT IS AN AGENT	Ontological, entity Ontological, personification, cause
21/50	1	At the risk of oversimplifying, I will say that the core idea behind linguistic minimalism is that all				

	2 3 4 5	the apparent complexity revealed in the course of pursuing a Cartesian Linguistics program is the result of few very simple computational mechanisms. Although the Minimalist Program as a whole may still be premature, there is little doubt that it offers an extremely useful perspective from a biological point of view, especially in the context of evolu- tion.13 With its emphasis on virtual conceptual necessity, minimalism reduces considerably the burden any evolutionary story has to bear. This is a welcome consequence because, to repeat, according to everyone's best guess, the human language faculty emerged very, very recently in the species, which makes it hard to seriously entertain an adapatationist, gradualistic story. There is just not enough time for such a complex object to be built step by step.				
22		3.2 The Key Novelty				
23/ 50-51	1 2 3 4 5	The hypothesis formulated in Hauser et al. (2002) and refined in Fitch, Hauser, and Chomsky (2005) offers a concrete example of the sort of research program that minimalism makes feasible in the study of Darwin's problem.14 According to Hauser et al., what distinguishes humans from other species is the FLN: the computational system that constitutes Narrow Syntax, specifically its recursive quality (the ability for unbounded embedding) and the way syntactic expressions maps the syntactic objects it constructs to the conceptual–intentional and sensory–motor systems. They claim that there is evidence that other species possess sensory–motor and at least some conceptual-intentional systems similar to our own (on the	*what distinguishes humans from other species* is the FLN They claim that there is evidence that other species possess *sensory–motor* and at least some *conceptual-intentional systems* similar to our own [...] These constitute the FLB	+distinctive feature +sensory-motor +conceptual-intentional systems +place +active +passive	THE FLN IS AN ENTITY THE FLB IS A COMPUTER THE FLN IS AN ENTITY FLB IS A MACHINE	Ontological, identifying aspects Ontological, identifying aspects Ontological, identifying causes

	6 6.1 7	sensory-motor side, see also Samuels 2009; for some of the conceptual richness in animals, see Hauser 2000, Carruthers 2006, Cheney and Seyfarth 1990, 2007, among many others). These constitute the FLB. (Hauser et al. 2002 leave open the possibility that once the FLN was in place, its presence led to modifications of FLB-components. For some evidence that this was the case on the sound side, see Samuels (2009). See also next section.) Hauser et al. (2002: 1574) point out that their hypothesis may have important consequences for how we think about the evolution of cognition: [The hypothesis that only the FLN is unique to humans] raises the possibility that structural details of [the FLN] may result from preexisting constraints, rather than from direct shaping by natural selection targeted specifically at communication. Insofar as this proves to be true, such structural details are not, strictly speaking, adaptations at all.	once the FLN *was in place*, *its presence led to modifications of FLB-components.* [The hypothesis that *only* the FLN is *unique to humans*] raises the possibility that *structural details* of [the FLN] may result from preexisting constraints, rather than from direct shaping by natural selection targeted specifically at communication.	+unique to humans +structural details +preexisting constraints +passive	FLN IS AN ENTITY POSSIBILITIES ARE UP HIPOTHESES ARE PEOPLE FLN IS A BUILDING NATURAL SELECTION IS AN ARCHITECT	Ontological, entity Ontological, identifying aspects Orientational Structural, conventional, literal live Structural, marginal, literal live. Ontological, personification
24 / 51-52	1 2 3 4 5 6	It may be useful to point out that the evolutionary novelty that Hauser, Chomsky, and Fitch dub the FLN need not conflict with Darwin's important claim that novelty is often the result of descent with some significant modification. Indeed, genuine novelty, in the sense of emergence of completely new processes, is extremely rare in the biological world. Nature, as Jacob famously pronounced, is a tinkerer. But although many have seized on Jacob's pronouncement to stress the klugy, higgledy-piggledy aspect of evolution, I do not think that this is Jacob's most important lesson. I think Jacob wanted to				

	7 8 9 10 11	emphasize that novelty in the organism's physiology, anatomy, or behavior arises mostly by the use of conserved processes in new combinations at different times and in different places and amounts, rather than by the invention of completely new processes. This is exactly what Darwin meant by his term "descent with modification" (a term which he preferred to "evolution"). Germans would say that novelty is characterized by Um-bildung ('reformation', 'recombination'), not by Neu-bildung ('new formation')—topological variations, not introductions of novel elements. As Gould (1977: 409) clearly stated, "there may be nothing new under the sun, but permutations of the old within complex systems can do wonders." Novelty in biology arises the same way water arises from combining the right amount of H and of O. Notice that if this characterization of biological novelty is borne in mind, the fact that specificity is not consistently reflected in brain images, genetic disorders, etc. need not lead to a crisis for cognitive sciences, as is sometimes thought (see the literature against modularity). It is just what you expect if novelty arose through recruitment and subsequent diversification. It may well be that we are not yet at a stage where we detect diversification among recruited parts, a message which I think goes along the lines stressed by Josef Grodzinsky in recent work (see also Marcus 2006).				
25/ 52		3.2.1 The lexical envelope as the locus of linguistic specificity				

26/ 52	1 2	The literature following Hauser et al. (2002) has focused on their claim that a key property of the FLN is recursion (ignoring the fact that Hauser et al. explicitly mentioned the possibility that the FLN may be empty, as well as their emphasis on the issue of interfaces—the mapping of syntactic expressions onto the right mental components). Here I will show how a specific characterization of recursion may have important consequences for another seemingly unique and language-specific property of human cognition, the ability to build a lexicon.	The literature following Hauser et al. (2002) has focused on their claim that a key *property* of the FLN is recursion (ignoring the fact that Hauser et al. explicitly mentioned the possibility that the FLN may be *empty,* as well as their emphasis on the issue of interfaces—the mapping of syntactic expressions onto the right mental components) I will show how a specific characterization of recursion may have important consequences for another seemingly *unique* and language-*specific property of* human *cognition,* the ability to build a lexicon.	+recursion (key) +empty +unique +specific property	THE FLN IS A SUBSTANCE THEORIES ARE PLACES THE FLN IS A CONTAINER COGNITION IS A MACHINE LANGUAGE IS A (SPECIFIC) PROPERTY LEXICON IS A BUILDING (PASSIVE)	Ontological, substance Structural, marginal, literal live Ontological, identifying aspects Structural, conventional, literal live Ontological, identifying aspect Structural, conventional, literal live
27/ 52-53	1 2 3 4 5 6 7 8	Chomsky (2004a) has identified Merge as the most basic procedure that could yield recursive structures of the sort that the FL makes use of. In its simplest form, Merge takes two elements *alpha* and *beta*, and combines them into a set {*alpha, beta*}. Iterative applications of Merge yield recursive structures {‰, . . . {„, {·, , }} . . . }.15 Here I would like to concentrate on the property that makes elements mergeable. After all, set formation is a very basic computational operation, one that is unlikely to be unique to humans or specific to language. What is remarkable and unique about the FL (and perhaps derivative systems like our improved number sense) is the	Chomsky (2004a) has identified Merge as the most basic procedure that could yield recursive structures of the sort that the FL makes use of *set formation is a very basic computational operation*, one that is unlikely to be *unique to humans or specific to* language. What is *remarkable and unique* about the FL [...]is *the fact that Merge is recursive* in other words, what makes Merge possible in the first place	+active +set formation +specific +remarkable +unique +Merge (recursive) +linguistic computation	THE FL IS A PERSON LANGUAGE IS A MACHINE (COMPUTER) THE FL IS A COMPUTER MERGE IS A LINGUISTIC COMPUTATION	Ontological, personification Structural, conventional, literal live Ontological, identifying aspects Ontological, identifying aspects

	9 10 11	fact that Merge is recursive in other words, what makes Merge possible in the first place remains available throughout a linguistic computation. Following a suggestion of Chomsky's (see Chomsky 2005), I would like to attribute this fact to the idea that lexical items are sticky. They have what Chomsky calls an edge feature. The following passage, from Chomsky (2008: 6) makes this clear: For a L[exical] I[tem] to be able to enter into a computation, merging with some [syntactic object], it must have some property permitting this operation. A property of an LI is called a feature, so an LI has a feature that permits it to be merged. Call this the edge-feature (EF) of the LI.	remains available throughout a *linguistic computation.*			
28/ 53		As I suggest elsewhere (Boeckx, in progress), we can think of the process of lexicalization as endowing a concept with a certain inertia, a property that makes the lexical item active (i.e. allows it to engage in Merge relations).16				
29/ 53		We can represent a lexicalized concept C endowed with an edge feature as: {C} (a concept with a lexical envelope), or +{C}, with the + sign representing the edge property that allows further combination, much like a free electron allows bonding in chemistry.17 We can also think of the lexical envelope as a mapping instruction to the Conceptual–Intentional system to "fetch a concept C" (see Pietroski, to appear). Thus conceived, the process of lexicalization not only makes				

		Merge possible, it also achieves what amounts to a demodularization of concepts. We can in fact think of lexicalization as the mental analog of the hypothetical creation of a truly universal currency, allowing transactions to cross formerly impenetrable boundaries.				
30 / 53-54	1 2 3 4 5 6 7 8 9	I take it that Jerry Fodor is right to think of the mind as consisting at least in part of a variety of modules (the exact number and identity of which are not important for my purposes). I also assume that the modular mind is not a uniquely human attribute, but is in fact quite widely shared with other species. The ethology literature is replete with evidence that throughout the animal kingdom creatures are equipped with specialized behaviors, many of which require a certain amount of highly specific triggering experience, which crucially transcend the limits of any behaviorist stimulus-response schema. I follow Gallistel, Hauser, Marler, Cheney, and Seyfarth, and many cognitive ethologists in claiming that animals come equipped with learning organs (a.k.a. modules or core knowledge systems). Remarkably, as I will emphasize in the next section, humans appear to be uniquely endowed with the ability to consistently go beyond the limits of these modules and engage in systematic cross-modular combinations (i.e. cross-modular thought). I would like to claim that it is the process of lexicalization that underlies this ability to extract concepts from their modular bounds. It is as if the lexical envelope (the edge feature) on the one				

		hand makes the content of a concept opaque to the computational system (a hard atom in Fodor's 1998 sense), and, on the other, frees this concept from its limited (modular) combinatorial potential (for a similar view, see Pietroski, to appear). Once lexicalized, concepts can be combined freely (via Merge) as expressions like Chomsky's Colorless green ideas sleep furiously or Lewis Carroll's "Jabberwocky" attest. Syntactic relations cease to depend on (semantic/conceptual) content; presumably, by the same token, the semantics of "words" cease to be tied to (externalist) notions like reference (which may well be at work inside modules).				
31/ 54	1 2 3 4 5	I am surrounding the term "word" with quotation marks because I want to emphasize the fact that linguistic words are not merely sound–meaning pairs; they are mergeable items. Word formation (in this sense) is as specific and unique to the FL as recursion. Accordingly, the oftenmade claim that members of other species may acquire words, but may lack the ability to combine them (see Anderson 2004 on Kanzi) must be qualified. Acquiring words in the context of the present discussion cannot be dissociated from being able to freely combine them. If one insists on designating the sound–meaning associations attested in others species as "words," then we should say that FL lacks words, but instead possesses lexical items.	*Word formation* (in this sense) is as *specific and unique* to the FL as *recursion*. FL *lacks words*, but instead *possesses lexical items*.	+word formation +specific +unique +recursion +possess -words +lexical items	THE FL IS AN ENTITY THE FL IS AN ENTITY LEXICAL ITEMS ARE OBJECTS	Ontological, entity Ontological, entity Ontological, identifying aspects
32/ 54	1 2 3	My claim in this section is that the edge feature, the catalyst for recursive Merge, is the one key property that had to evolve. I am silent on precisely how it evolved.				

	4 5 6	It may be the result of random mutation, or an exaptation. Perhaps we will never know for sure, but it is something that is now part of our biological endowment (albeit maybe indirectly coded, perhaps as part of brain growth)—what Chomsky (2005) would call a first factor component. Other properties standardly attributed to Merge, such as binary branching or the phasal property of certain nodes (the ability of certain nodes to trigger transfer of their complements to the interfaces), may instead be the result of non-genomic, third factor principles.18 In the remainder of this section I will focus on binary branching, and assume that cyclicity (spell-out by phases) is a specific implementation of the general chunking strategy that pervades the cognitive world, especially when working memory is involved (see Miller 1956, Feigenson and Halberda 2004, Terrace 2005, among many others).19				
33/ 55	1	3.2.2 On the distribution of lexical material in natural languages	On *the distribution of* lexical *material in natural* languages	+lexical material +natural	LANGUAGES ARE PLACES LEXICAL ITEMS ARE OBJECTS	Ontological, reference Ontological, identifying aspects
34/ 55	1 2 3 4	Since Kayne (1984) it has been standard to take syntactic representations to be constrained by a binary branching requirement; in modern parlance, Merge can only combine two elements at a time. For Kayne, the binary branching requirement on syntactic structures was imposed to ensure that paths (the set of nodes between two elements establishing a syntactic dependency) be unambiguous (basically, binary branching reduces the number of routes an element might take to connect to another element).				

		Chomsky has also at times suggested that binary branching may be imposed by an overarching requirement of efficient computation (see Chomsky (2004a: 115), and especially Chomsky (2005: 16), where "minimization of search in working memory" is hinted at). I would like to claim in this subsection that the intuition that binary branching may be the result of third-factor considerations is on the right track, and can in fact be strengthened by taking into account results achieved on completely independent grounds in Bejan (2000).				
35/ 55-56	1 2 3 4 5 6 7 8 9 10	For a number of years Bejan has been studying systems that exhibit binary-branching (bifurcation, pairing, dichotomy) properties, and has hypothesized that all these systems are organized in this way as a result of an optimiztion process. Specifically, he has established on the basis of a wide range of examples (from systems of nature to artificial systems in engineering) that flow systems that connect one root point to a finite-size area or volume (an infinity of points) display tree-shaped networks. He claims that the shape of the network can be deduced from considerations guaranteeing easiest access (optimal flow). Bejan is careful to stress that exactly what flows is largely irrelevant (it can be electricity, water currents, and, I would add, information such as lexical/conceputal information); what matters is how what flows flows. Bejan is able to show mathematically that the binary branching the networks he studies exhibit is one of constant resistance—that is, one that defines the path of least resistance for all that points in an area/volume that have to be				

	11 12 13	squeezed through a single exit (one that minimizes entropy generation). The basic intuition is one that Galileo already had, when he investigated ways of defining a beam of constant strength. Galileo concluded that a beam of constant strength is one in which the maximum stress (pressure) is spread as much as possible through the body of the beam. This is equivalent to a binary-branching tree. It is indeed easy to see that a uniformly binary-branching tree is better equipped to provide the least resistance for whatever is flowing from a terminal node to a root note. The maximum resistance is defined by the maximum number of branches meeting at a single point. In a binary branching tree, the maximum number (nmax) is 2. This is less than if the tree exhibits uniform ternary branching ((nmax = 3), or if the tree varies in its branching configuration (making some points of access more resistant than others). This is equivalent to minimizing the maximum pressure difference across points.				
36/ 56	1 2 4	Bejan notes that dendritic patterns occur spontaneously in nature when flow systems are large and fast enough, because it is Y-shaped flow systems that minimize volume/area-to-point resistance (thermodynamic optimization). By the same reasoning, he is able to predict the shape of snow flakes, the emergence of fractal structures, and even deduce Fermat's Principle of Least Time/Maupertuis's Principle of Least Action (Path of Least Time = Path of Easiest/Fastest Access = Path of Least Resistance).				

		A binary-branching tree is thus one that achieves constant minimax stress/resistance across the length of a derivation—a sort of smooth design, where no single point bears more than two relations at any given time.				
37/ 56	1 2	Nature thus appears to favor slender trees, achieving resistance minimization through growth. It optimizes access by optimizing the internal geometry of the system, achieving a stationary optimal configuration, an optimal space allocation, which patterns according to a scaling law already recognized by Murray (1926), where W = 2d (W = width, d = depth).				
38/ 56	1	I submit that syntax performs its objective (providing instructions to external mental systems; squeezing a phrase structure representation through a spell-out point; a volume/area-to-point situation) in the best possible manner; with binary branching emerging as a balancing act that guarantees equipartition (optimal spacing, or uniform spreading) of terminals.				
39/ 56	1 2 3 4 5 6	By focusing on the structure of flow systems, Bejan reveals nature's urge to optimize. Bejan notes that the tree-shaped networks he studies are astonishing in simplicity and robustness, holding across the inanimate, the animate, and the engineered realms. By bringing optimization considerations to bear on issues such as why tubes and streams bifurcate, Bejan can rationalize the geometry of all these structures. But it is important to stress that the optimization at issue is one without search; it is emphatically not the sort of optimization that ultra-Darwinists like Dawkins advocate (see e.g. Dawkins 1982).				

		For them, optimal structures are the inevitable result of trials-and-errors over a very long period. Ultra-Darwinists study the slow making of the fittest, whereas Bejan studies the spontaneous emergence of the best. (It is interesting to note that the very same optimization considerations led Bejan in recent work to vindicate Galileo's intuition that animal locomotion is optimal; see Bejan and Marden 2006.)				
40/ 56-57	1 2 3	Bejan explicitly sees his work as consolidating Leibniz's intuition that of all the possible processes, the only ones that actually occur (spontaneously) are those that involve minimum expenditure of "work (action)." Reinforcing rationalist tenets, Bejan stresses that only explanations of this kind—ones that appeal to nature laws—enable the scientist to make better sense (I would say, perfect sense) of the object of study. Only the appeal to general laws lends a certain sense of inevitability to the explanation, and hence a certain sense of genuine satisfaction, to the explanation—a sense that one has gone beyond explanatory adequacy, an indication that nature can be understood more simply, a sign that it is not chance, but necessity alone that has fashioned organisms.				
41/ 57	1 2 3 4	In sum, Bejan's work suggests that there is at least one way in which the shape of Merge can be understood as the optimal distribution of terminals ("an optimal distribution of imperfections," as Bejan puts it), the result of optimization of lexical access. Like traffic patterns, Y-shaped phrase structure representations seek to spread out flowing material to avoid bottleneck effects. This need not be coded in the	if the FL *is* optimally *designed*	+passive +design	THE FL IS A BUILDING	Ontological, identifying aspects

		genome. As soon as Merge is available (as soon as edge features/lexical envelopes have emerged), it would follow as a matter of course that Merge will exhibit a binary branching character if the FL is optimally designed.				
42	|	3.3 The Seat of Humaniqueness and the Ascent of Homo combinans				
43/ 57	1 2 3 4 5 6	In this section I would like to return to the process of lexicalization, the key event in the evolution of the FLN, and suggest that it may be the source of Man's unique abilities (humaniqueness, as Hauser felicitously dubbed it), that Great Leap Forward that gave us our niche. It is commonly assumed that the key evolutionary step that gave us our distinctness is cognitive in nature.20 Accordingly, the quest for humaniqueness amounts to identifying the factors that make human cognition special. In the words of Hauser (2008), [a]nimals share many of the building blocks that comprise human thought, but paradoxically, there is a great cognitive gap between humans and animals. By looking at key differences in cognitive abilities, [we hope to] find the elements of human cognition that are uniquely human. The challenge is to identify which systems animals and human share, which are unique, and how these systems interact and interface with one another.	I would like to return to the process of lexicalization, the key event in the *evolution* of the FLN, and suggest that it [lexicalization] may be the source of Man's unique abilities	+evolution +lexicalization	THE FLN IS AN ORGANISM LEXICALIZATION IS A NATURAL EVENT LEXICALIZATION IS A PLACE	Ontological, entity Ontological, cause Ontological, reference
44/ 57-58	1	The program can be seen as an extension of Hauser et al. (2002), from the FLN to HCN (Human Cognition in the Narrow sense; that which is specific and unique to human cognition), or (building on Fodor 1975), LOTN (Language of				

		Thought Narrow).				
45/ 58	1 1.1 1.2 1.3 1.4	Hauser presents four evolved mechanisms of human thought that give us access to a wide range of information and the ability to find creative solutions to new problems based on access to this information: 1. the ability to combine and recombine different types of information and knowledge in order to gain new understanding; 2. to apply the same rule or solution to one problem to a different and new situation; 3. to create and easily understand symbolic representations of computation and sensory input; and 4. to detach modes of thought from raw sensory and perceptual input.				
46/ 58	1 2 3 4 5 6 6.1 6.2 6.3	Details of formulation aside, Hauser's hypothesis is a very familiar one. The essence of Hauser's claim really goes back to the Descartes's fascination with human cognitive flexibility, its fluidity, its detachment from perception, and its unbounded character—in short, its creative character. This is what led the Cartesians to claim that Man has no instinct, by which they meant that Man's cognitive faculties rise above the hic and nunc. This was clear to Konrad Lorenz as well, who said that "man is a specialist in not being specialized" (Lorenz 1959). As Marc Hauser likes to put it, while other animals display laser-beam-like intelligence (highly precise specificity), humans intelligence is floodlight-like (generalize specificity) in character. Tattersall (1998: 197) calls it "the human noncondition" and writes:				

		. . . [O]ver millenia now, philosophers and theologians have made something of an industry of debating the human condition. Even if inevitable, it is rather ironic that the very species that apparently so much enjoys agonizing over its own condition is, in fact, the only species that doesn't have one—or at any rate, whose condition, if any, is most difficult to define. Whatever condition is, it is surely a lot easier to specify it in the case of an amoeba, or a lizard, or a shrew, or even a chimpanzee, than it is in our own.				
47/ 58	1	Elsewhere (p. 207), Tattersall notes that in our case, "natural selection has gone for 'flexibility' instead of specificity in behavior" (something which one may attempt to relate to Gould's 1977 discussion of "neoteny").				
48/ 58-59	1 2 3 4	To be sure, scientists have found that some animals think in ways that were once considered unique to humans. For example, some animals have episodic memory, or non-linguistic mathematical ability, or the capacity to navigate using landmarks. In sum, animals have a rich mental life, full of modules or what Liz Spelke calls "core knowledge systems." What Man seems to have in addition is the ability to systematically transcend the boundaries of modular thought and engage in cross-modular concept formation.				
49/59	1	I would like to claim that this ability of building bridges across modules is directly related to language, specifically the ability to lexicalize concepts (uprooting them from their modules) and combine them freely via Merge.	this ability *of building bridges across module*s is directly *related to* language, specifically t*he ability to lexicalize concepts* (*uprooting* them *from their module*s) and c*ombine them* [CONCEPTS] freely *via* Merge.	+building bridges +lexicalize concepts +combine (concepts) +active	LANGUAGE IS AN ARCHITECT/ ENGINEER LANGUAGE IS A BUILDING CONCEPTS ARE PLANTS LANGUAGE IS A GARDENER MERGE IS A TOOL	Ontological, personification Structural, marginal, literal live Ontological, identifying aspects Ontological, personification Ontological, entity
50/59	1	I am by no means the first to speculate along these lines.				

	2 2.1	Spelke (2003), Carruthers (2006), Pietroski (2007), Tattersall (1998), Chomsky (2005), and, to some extent, Mithen (1996), all agree with Descartes that language plays a significant role in human cognition. Darwin himself appears to be in agreement when he writes in *The Descent of Man*, If it could be proved that certain high mental powers, such as the formation of general concepts, self-consciousness, etc., were absolutely peculiar to man, which seems extremely doubtful, it is not improbable that these qualities are merely the incidental results of other highly-advanced intellectual faculties; and these again mainly the result of the continued use of a perfect language. (p. 126)				
51/59	1 2	The emergence of lexical items was the sort of perfect storm that gave Man his niche. Once concepts are dissociated from their conceptual sources by means of a lexical envelope, the mind truly becomes algebraic and stimulus-free.				
52/ 59	1 2 3 4 5 6	The creation of the human lexicon, which, if I am correct, goes hand in hand with Merge, is what lies behind the creative aspect of our thought process, which fascinated both Descartes and Chomsky. Edge features are the set of humaniqueness. With language, creativity emerged, understood (as did Arthur Koestler) as "the sudden, interlocking of two previously unrelated skills or matrices of thought," an almost limitless capacity for imagination, metaphorical extension, etc.21 Note that one need not follow Hauser (2008) in positing four distinct mechanisms to account for humaniqueness. One key event (the emergence of edge features) suffices. Going back to Hauser's four ingredients for human specificity listed above, we can now claim that by	*With* language, creativity *emerged*, understood [...] as "the sudden, *interlocking* of two previously unrelated *skills or matrices* of *thought*," an almost *limitless capacity* for imagination, metaphorical extension, *etc.*	+emergance +creativity +active SIMIL	LANGUAGE IS A SUBSTANCE CREATIVITY IS A SUBSTANCE THOUGHT IS A COMPUTING PROGRAM	Ontological, substance Ontological, substance Structural, marginal literal live

		means of lexical envelopes, humans are able to "detach modes of thought from raw sensory and perceptual input," and lexicalize at will ("create and easily understand symbolic representations of computation and sensory input"). Via Merge, humans have "the ability to combine and recombine different types of information and knowledge in order to gain new understanding, and apply the same rule or solution to one problem to a different and new situation."				
53/ 60	1 2 3 4	With edge features and Merge, the human mind became capable of true Swiss-army-knife style cognition. Before that the tools at the animal's disposal were exquisitely tuned to their tasks, but too isolated. Their effects could only be combined sequentially; they could not be seamlessly and smoothly integrated with one another. With language, the human mind developed into a key ring, where all keys (concepts) can be combined and available at once, thanks to the hole (edge feature) that they all share.	*With* language, the human mind *developed into* a *key ring*, where all keys *(concepts)* can be *combined* and available at once, thanks to the hole (edge feature) that t*hey all share.*	+human mind +key ring +concepts +combinations	LANGUAGE IS AN OBJECT (KEY RING) THE HUMAN MIND IS AN OBJECT CONCEPTS ARE KEYS	Ontological, entity Ontological, entity Ontological, entity
54/ 60	1 2 3	One could say that the ability to endow a concept with an edge feature was, to paraphrase Armstrong, a relatively small step for a man, but a giant leap for mind-kind (and mankind). As Dennett (1996: 17) puts it (in agreement with the intuition behind Cartesian dualism), "perhaps the kind of mind you get when you add language to it is so different from the kind of mind you can have without language that calling them both minds is a mistake."	*the kind of mind you get* when *you add* language to it is so different from the k*ind of mind you can have without* language that *calling them* both *minds* is a *mistake*	+ingredient +passive	THE MIND IS A RECEIPT LANGUAGE IS AN INGREDIENT	Structural, conventional, literal live Ontological, entity
55/ 60	1	Merge/edge features gave Man a truly general language of thought, a lingua franca, where	Merge/edge features *gave Man* a *truly general* language *of*	+ passive	MERGE FEATURES IS AN ENTITY LANGUAGE IS AN	Ontological, personification

	2 3 4	previously there were only modular, mutually incomprehensible, dialects/ (proto-) languages of thoughts. It significantly altered Man's conceptual structures—how humans think the world. By merging lexicalized concepts, Man was able to hold in mind concepts of concepts, representations of representations, and associations of associations. Homo became Homo combinans.	*thought*, a *lingua franca*, where previously there were only *modular,* mutually *incomprehensible*, *dialects/(proto-)* languages *of thoughts.*		OBJECT (OF THOUGHT)	Ontological, entity
56/ 60	1	The result of the emergence of the FLN was a creative, cultural explosion well attested in the archeological record (art, symbol, music, notation, feelings of mystery, mastery of diverse materials, true innovation in toolmaking, sheer cleverness), a "quantum leap," as Tattersall (1998) calls it.				
57	1 2 2.1 2.2 2.3	I agree with Tattersall (1998: 171) that "it is very hard to avoid the conclusion that articulate language is quite intimately tied up with all the other mysterious and often unfathomable aspects of modern human behavior."22 Tattersall (1998: 186, 228) notes further, Almost all of the unique cognitive attributes that so strongly characterize modern humans—and that undoubtedly also distinguished our fellow Homo sapiens who eliminated the Neanderthals—are tied up in some way with language. Language both permits and requires an ability to produce symbol in the mind, which can be reshuffled and organized by the generative capacity that seems to be unique to our species. Thought as we know it depends on the mental manipulation of such symbols, which are arbitrary representations of features belonging to both the internal and outside world.	Language both *permits* and *requires* an *ability to produce symbol in the mind,*	+active +symbol	LANGUAGE IS A PERSON SYMBOL IS AN OBJECT THE MIND IS A PLACE	Ontological, personificati on Ontological, entity Ontological, reference
58/ 61	1 2	Through Merge/edge features, we became the symbolic species —a transformative experience that is directly reflected in the archeological records. As Camps and Uriagereka	*aspects* of Homo sapiens's tool-making *seem to require the*	+mental computation	THE FLN IS A COMPUTER	Ontological, identifying aspects

		(2006) have noted, aspects of Homo sapiens's tool-making seem to require the kind of mental computation that are distinctive of the FLN (the discussion in Mithen 1996: 76 can also be interpreted in this way).	*kind of mental computation* that are *distinctive of the* FLN			
59/ 61	1 2 3 4	Monboddo—one of the forefathers of evolutionary thought—was clearly correct in his belief that language is "necessarily connected with an[y] inquiry into the original nature of Man." As Tattersall (1998: 58) writes, "universal among modern humans, language is the most evident of all our uniqueness." Tattersall goes on to note (p. 68) that our closest relatives "do not display 'generativity,' the capacity that allows us to assemble words into statements or ideas into products." It seems to me that edge features are a good candidate for the source of this very generativity, and humaniqueness.	Monboddo [...]was clearly correct in his belief that language is "necessarily *connected with* an[y] inquiry *into* the original nature of Man." universal *among modern humans,* language is *the most evident of all our uniqueness.*	+connected (into the nature of man) +universaL +unique	LANGUAGE IS AN OBJECT THE (ORIGINAL) NATURE OF MAN IS A PLACE LANGUAGE IS A LANDMARK	Ontological, entity Ontological, setting goals Ontological, identifying aspects
60/ 61		3.4 On the Importance of Distinguishing between Language and the Language Faculty				
61/ 61	1 2 3 4 5 6	The scenario I have sketched does not account for all aspects of the FL, but it surely alleviates the explanatory burden that evolutionary hypotheses face in light of the rapid emergence and spread of "Merge-man" (Homo combinans). And perhaps it is just as well that the hypothesis I have sketched does not cover all aspects of what we would call language, because it is not at all clear that unification of all aspects of language is desirable. Language is almost surely not a natural object. It is an object of our folk psychology/biology.	*The scenario I have sketched* does not account for all aspects of the FL, *the hypothesis* I have sketched *does not cover* all aspects of *what we would call language*, Language *is* almost surely *not a natural object.* It [language] *is an object of our folk psychology/biology.*	+aspects +aspects - natural object +object of folk psychology/ biology +real object (of study) +passive	THEORIES ARE BUILDINGS THE FL IS AN ENTITY THEORIES ARE BUILDINGS LANGUAGE IS AN ENTITY LANGUAGE IS AN (ARTIFICIAL) OBJECT LANGUAGE IS AN OBJECT	Structural, conventiona l, literal live Ontological, entity Structural, conventiona l, literal, live Ontological, entity Ontological, entity Ontological, entity

	7 8	The FL is the real object of study. The FL, like the hand, the nose, and other properties of our organism, is put to use in countless ways, and it would be foolish to expect any theory to capture all these aspects. The term "language" is a remnant of philological thinking; ignoring the basic distinction between competence and performance is bound to lead to the claim that language is messy or klugy. Instead, if one focuses on the language organ, I think that signs of good design emerge very quickly.	The FL is the real object of study. *The FL*, like the hand, the nose, and other properties of our organism, *is put to use* in countless ways *The term* "language" *is a remnant of philological thinking;* that language *is messy or klugy.* if one focuses on the language organ, I think that *signs of good design emerge very quickly*.	+property +messy +organ +good design	THE FL IS AN OBJECT (OF STUDY) THE FL IS A TOOL PROPERTIES OF THE ORGANISM ARE OBJECTS THE ORGANISM IS A MACHINE LITERAL USE EXAMPLE WORDS ARE LEFTOVERS DISCIPLINES ARE MEALS LANGUAGE IS A DISORGANIZED PLACE LANGUAGE IS AN ORGAN LANGUAGE IS A BUILDING	Ontological, identifying aspects Ontological, identifying aspects Ontological, entity Structural, conventional, literal live Ontological, identifying aspects Structural, conventional, literal live Ontological, identifying aspects Ontological, entity Structural, marginal, literal live
62 / 61-62	1 2 3 4	This said, the discussion above has left out important aspects traditionally associated with the FL. For example, I have said very little about the way linguistic expressions are externalized. I have tacitly assumed the correctness of a long-standing intuition (already present in the writings of the Cartesians) that the FL's core function is basically that of providing a syntax of thought (Language of Thought in the narrow sense, LOTN). As Chomsky (2008: 136) remarks, It may be that there is a basic asymmetry in the contribution to language design of the two interface systems: the primary contribution to the structure of [the] F[aculty of] L[anguage] may be optimization of the C-I [sense] interface.	the discussion above *has left out* important *aspects* traditionally *associated with the* FL. the FL's *core function is* basically that of *providing a syntax of thought* (Language of Thought in the narrow sense, LOTN). *there is a basic asymmetry in the contribution to* language *design* of the *two interface systems:* the primary contribution *to the structure* of [the] F[aculty of] L[anguage] may be *optimization of the C-I [sense] interface*.	+important aspects left out +core function +syntax of thought +asymmetry +design +two interface systems +passive +optimization of the C-I	ARGUMENTS ARE PEOPLE ASPECTS ARE OBJECTS TO BE STORED THE FL IS AN OBJECT THE FL IS A COMPUTER SYNTAX IS AN OBJECT SYNTAX IS A COMPUTING PRODUCT (LOTN) LANGUAGE IS A COMPUTING PROGRAM THE FL IS A COMPUTING PROGRAM	Structural, conventional, literal live Ontological, identifying aspects Ontological, entity Structural, marginal, literal live Ontological, entity Structural, conventional, literal live Structural, marginal, literal live Structural, arginal, literal live

63/ 62	1 2 3 4 5	From this perspective, externalization appears to be an addendum—(quite literally) an afterthought. This may explain why the nature of morpho- phonology appears to be radically different (see Bromberger and Halle 1989, Blevins 2004). This is not to say that morpho-phonology is not part of laguage. It clearly is. But it is just that the syntax–phonology connection is much looser, and less constitutive of the FL than the mapping from syntax to thought.	This is not to say that *morpho-phonology is not part of* laguage. [It clearly is] the *syntax–phonology connection is* much *looser*, and *less constitutive of the FL* than t*he mapping from syntax to thought*.	+morphophonology +syntax-phonology connection (looser) +mapping from syntax to thought	LANGUAGE IS AN ENTITY THE FL IS A BUILDING SYNTAX IS A PLACE THOUGHT IS A PLACE SYNTAX-THOUGHT RELATION IS A ROAD	Ontological, entity Structural, marginal, literal live Ontological, reference Ontological, reference Structural, Conventional, literal live
64/ 62	1 2	I also said nothing regarding the size of the lexicon, or the way words are acquired. Although I have argued that the nature of lexicalization is crucial to the FLN, I do not think that the size of the lexicon or some of the strategies used in its acquisition must be regarded as unique to language (or specific to humans). Clearly, syntax plays a role in carving the path of acquisition to some extent (as Lila Gleitman and colleagues have revealed over the years; Gleitman et al. (2005); see also Borer 2005), but other aspects, not specifically linguistic, surely come into play (see Bloom 2000). As for the size of our vocabulary, it is likely to be tied to our ability to imitate—unique to us, but not specific to language (Hauser 1996, 2000; Tomasello 1999).	Although I have argued that t*he nature of lexicalization is crucia*l to the FLN, *the size of the lexicon or some of the strategies used in its acquisition* must be regarded as *unique to* language (or specific to humans).	+nature of lexicalization is crucial +- unique (size or strategies)	THE FLN IS AN ENTITY THE LEXICON IS AN ENTITY ACQUIRING A LEXICON IS WAR LANGUAGE IS AN ENTITY	Ontological, identifying aspects Ontological, entity Structural, conventional, literal live Ontological, identifying aspects
65/ 62-63	1	Finally, there is another aspect of the FL that I have not touched on and that many would have regarded as central to language (indeed part of the FLN) until	there is *another aspect* of the FL that *I have not touched on and* that many would	+tangible aspect (-central to language) +part of FNL	THE FL IS AN ENTITY ASPECTS ARE OBJECTS PARAMETERS ARE OBJECTS LANGUAGE IS AN	Ontological, entity Ontological, entity Ontological,

		recently, and that is parameters —the points of variation pre-	*have regarded as central* to language	+parameters	ENTITY	entity
	2	defined by Universal Grammar, the open variables in universal linguistic principles.	(indeed *part* of the FLN) until recently, and that is *parameters*		THE FLN IS AN ENTITY	Ontological, entity
						Ontological, entity
	3	I argue in Boeckx (this volume) that perhaps UG is not as overspecified as traditionally		-parameters		
	4	thought in generative grammar.	There is indeed *a case to be made* that		PARAMETERS ARE OBJECTS	
		There is indeed a case to be made that parameters are not	*parameters are not constituents* of the		THE FNL IS AN ENTITY	Ontological, identifying aspects
	5	constituents of the FLN.	FLN.			Ontological,
	6	Rather, they may be the necessary result of a very impoverished, underspecified				entity
	7	system (that is to say, some parametric effects may be epigenetic).		+phrases		
					LANGUAGE IS A PLACE	
	8	Let me illustrate what I mean with one clear example.	Under most accounts [...], *phrases in natural* language a*re assumed to be underspecified with regard to the directionality of headedness*.			
	9	Take the fact that phrases are headed (a property known as endocentricity).		+-head-initial +-head-final		Ontological, reference
	10	Under most accounts (but see Kayne 1994), phrases in natural			LANGUAGE IS AN OBJECT (POSSESSION)	
	11	language are assumed to be underspecified with regard to the directionality of headedness.		+parametric variation		
		One can formulate this as a principle with open values, as in "syntactic projections must be [right/left] headed."	children know that projections have to be headed, but *have to figure out* whether *their* language is *head-initial or head-final.*		THE FLN IS A BUILDING	Ontological, entity
		From the acquisition standpoint, children know that projections have to be headed, but have to figure out whether their language is head-initial or head-final.				Structural, marginal, literal live
		They must pick one or the other option.	that instead of *building the parametric variation into linguistic principles* (FLN), we could get the same result from letting it follow (logically) from the fact that each phrase must be linearized			
		However, note that instead of building the parametric variation into linguistic principles (FLN), we could get the same result from letting it follow (logically) from the fact that each phrase must be linearized, and, since externalization proceeds through a narrow, one-dimensional channel, the physics of speech will force the very choice that the head parameter is supposed to code for.				

66	1 2 3 4 5	Generally speaking, I believe that a more minimalist understanding of parameters ought to move underspecification from the domain of individual principles to the system as a whole. It is because the system is not richly specified in the genome, because the FLN is so minimalist, that not every aspect of the FL is fixed once and for all, and therefore variation is expected. This view on variation meshes well with Kirschner and Gerhart's (2005) theory that variation results from underspecified parts of system that allow organism to explore the fullness of space pre-defined by their flexibly connected constituents, freeing the genome from registering rigidly the space of variation. The same logic underlies the temporal retardation of development, especially prominent in humans—with absence of early rigidification leading to bigger potential (neoteny; see Gould 1977). Less is indeed more.23 Once available, non-genomic parametric dimensions would be made use of, in the same way that colored patterns on wings are used in butterflies to reinforce group boundaries, preventing possible interbreeding (a state of artifical speciation) (see Lukhtanov et al. 2005).	It is because the system is not richly specified in the genome, because the FLN *is so minimalist*, that *not every aspect of the* FL *is fixed once and for all*, and therefore *variation is expected.*	+minimalist	THE GENOME IS A COMPUTING PROGRAM THE FLN IS A PAINTING (BUILDING) THE FL IS A BUILDING	Structural, marginal, literal live Ontological, identifying causes Structural, marginal, literal imaginative
67	1	3.5 By Way of a Conclusion				
68/ 63-64	1 2	The formulation of concrete minimalist hypotheses, combined with recent developments in genetics that re-establish the balance between genes, environment, and organism (Lewontin's 2000 triple helix) and allow us to extrapolate back to our ancestors when the fossil record fails (see Kirschner and Gerhart 2005, Wade 2006), should enable us to not only regard the much	[THIS] should enable us to not only regard *the much publicized 1866 ban imposed by the* Linguistic Society of Paris on any debate *concerning the origin of* language *as passé,*	+origin	THE LINGUISTIC SOCIETY OF PARIS IS A PERSON DEBATES ARE JOURNEYS LANGUAGE IS AN ENTITY	METONIMY Structural, conventional, literal live Ontological, entity

	3 3.1	publicized 1866 ban imposed by the Linguistic Society of Paris on any debate concerning the origin of language as passé, but more importantly relieve Lewontin's (1998) unremitting attack on the plausibility of evolutionary stuies of cognitive faculties. I will not review Lewontin's points in detail here. Suffice it to say that he saw the problem of reconstruction in the absence of record as insuperable, and therefore all evolutionary account of cognition as ust-So stories. In his own words (p. 130): the best lesson . . . is to give up the childish notion that everything that is interesting about nature can be understood. . . . It might be interesting to know how cognition . . . arose and spread and changed, but we cannot know. Tough luck.				
69/ 64	1 1.2	It is hard to dismiss the views of giants like Lewontin, but those interested in Darwin's problem will no doubt find comfort in the following assertion made by Darwin himself in The Descent of Man: It has often and confidently been asserted, that man's origin can never be known: but ignorance more frequently begets confidence than does knowledge: it is those who know little, and not those who know much, who so positively assert that this or that problem will never be solved by science. (p. 3)				
70 /64	1 2 3 4 But there is no doubt that if we are to vindicate Darwin's view,	One could indeed point to many episodes where the end of a field has been announced right before important advances took this field to new heights. Perhaps we will never know for sure whether certain aspects of the FL emerged via adaptation or some other means, but already now it seems we can make some educated guesses about and some progress toward understanding how the FL could have evolved.	Perhaps we will never know for sure whether *certain aspects of the* FL *emerged* via adaptation or some other means, it seems we can make some educated guesses about and some progress toward understanding *how the* FL could have *evolved*.	+aspects +evolution	ASPECTS OF THE FL ARE SUBSTANCES THE FL IS AN ENTITY THE FL IS AN ORGANISM QUESTION	Ontological, identifying aspects Ontological, entity Ontological, entity

		the task that lies ahead will be supremely interdisciplinary and therefore extremely hard. To address Darwin's problem, it will be imperative to ask—simultaneously—distinct, but inextricably related questions, which I borrow from Piattelli-Palmarini and Uriagereka (2005): What is language such that it may have evolved? and, What is evolution such that it may have applied to language?	What is language such that it may have evolved? What is evolution such that it may have applied to language?		QUESTION	
71/ 64	1 2 3 4 5 6	Jackendoff (2002) is right: One's view on the evolution of language depends on one's view of language. But it also depends on one's view on evolution, which too many students of language have taken to be fixed along Dawkinsian lines. The point here is not to revive creationism or promote intelligent design. It is simply an attempt to strike a non-dogmatic balance between Form and Function, between Necessity and Chance. What I find most fascinating, from the perspective of a linguist, is that seemingly arcane discussions about Merge and the nature of lexicalization may contribute to our understanding of evolutionary theory. The language organ may become a model organism in the context of an extended modern synthesis in biology—extremely useful because surprisingly simple and optimal in its design.	One's *view on the evolution* of language *depends on one's view of* language. it also depends on *one's view on* evolution, which too many *students of* language *have taken to be fixed along* Dawkinsian *lines.* The language organ *may become a model organism in the context of an extended modern synthesis* in biology	+evolution +organ +active	THE EVOLUTION OF LANGUAGE IS A PLACE LANGUAGE IS A PLACE (EVOLUTION INSIDE) EVOLUTION IS A PLACE LANGUAGE IS AN OBJECT (OF STUDY) EVOLUTION IS A PLACE FIXED ON A CONTINENT THEORIES ARE CONTINENTS LANGUAGE IS AN ORGAN BIOLOGY IS A PLACE THEORIES ARE CHEMICAL SYNTHESES	Ontological, reference Ontological, reference Ontological, reference Ontological, entity Structural, marginal, literal imaginative Structural, marginal, literal live Ontological, entity Ontological, reference Structural, conventiona l, literal imaginative

APPENDIX 3

Discourse medium: written

Register: academic paper, subfield of biolinguistics

Text: Approaching Parameters from Below

Author: Cedrick Boeckx

Target lexeme(s): language, languages, FL, FLN, FLB

P	S	Sentences	Clause	Salient attribute	Linguistic metaphor	Type
1	1	10.1 Revisiting Plato's Problem				
2	1	"Our ignorance of the laws of variation is profound."				
	2	Darwin's words, taken from the Origin of Species (1964: 167), aptly characterize the current state of our knowledge of linguistic variation.				
	3	At a time when some linguists feel that some why-questions concerning the language faculty are ripe for the asking, there is no consensus regarding why linguistic variation should exist at all, let alone why it should take the form that we think it does.				
	4	There is indeed very little substantive discussion of the issue of linguistic variation in the context of the Minimalist Program.				
	5	This may come as a surprise to some, as it is fairly common in the literature to introduce the Minimalist Program in the context of the Principles-and-Parameters approach.	The Principles-and-Parameters approach, […] enabled to resolve in a feasible way *the tension between universal* and *particular aspects* of	+tension (between) +universal +particular	THEORIES ARE PEOPLE LANGUAGE IS A NATURAL FORCE (ELECTRICITY) ASPECTS OF	Ontological, personification Structural, marginal, literal live Ontological,

	6	Specifically, it is fairly common to say that the Minimalist Program grew out of the perceived success of the Principles-and-Parameters approach, which arguably for the first time in the history of the field enabled linguists to resolve in a feasible way the tension between universal and particular aspects of language, and offered a fruitful way of thinking about how children acquire their language (Plato's Problem).1	language, and offered *a fruitful way of thinking* about how children *acquire their* language	+acquisition +passive	LANGUAGE ARE ELECTICITY LANGUAGE IS AN OBJECT	identifying aspects Ontological, entity
	7	There is a lot of truth to this statement, but in the absence of important qualifications (rarely spelled out in the literature) it can be highly misleading.				
	8	In particular, it may give the impression that the specific implementation of the Principles-and-Parameters approach explored in the Government–Binding era essentially solves Plato's Problem (abstractly, of course, since no one is under the illusion that GB-theorists got all the details right).	A Principles-and-Parameters model [...] *conceived of* Universal Grammar *as consisting of two main ingredients*: *principles that were truly universal, manifest in* all languages, and, more importantly, *principles* whose formulations *contained open values* (*parameters*) that *had to be fixed in* the course of language acquisition.	+principles +universal +manifest +acquisition	THEORIES ARE PEOPLE UG IS A RECEIPT LANGUAGES ARE PLACES	Ontological, reference Structural, marginal, literal live Ontological, reference
	9	This impression must be dispelled, for the idea that a GB-style Principles-and-Parameters architecture provides the right format for a solution to Plato's Problem is, I think, seriously mistaken, on both empirical and conceptual grounds.2			PRINCIPLES ARE ENTITIES FORMULAS ARE BOXES VALUES ARE OPEN OBJECTS	Ontological, entity Ontological, identifying aspects
	10	A Principles-and-Parameters model of the GB style conceived of Universal Grammar as consisting of two main ingredients: principles that were truly universal, manifest in all languages, and, more importantly, principles whose formulations contained open values (parameters) that had to be fixed in the course of language acquisition.			LANGUAGE ACQUISITION IS A PATH	Ontological, identifying aspects Structural, marginal, literal live
	11	Such parametrized principles can be thought of as forming a network that is only partially wired up at the initial state, and that must await a fair amount of data processing to be fully operative.				
	12	(This is the switchboard metaphor made famous by Jim Higginbotham, adopted in Chomsky 1986: 146.)				
3	1	This way of thinking about the acquisition process has had				

		undeniable success.				
	2	It has led to a revival of acquisition studies, and produced some extremely interesting results, in the domains of language development and of comparative syntax.	[THIS] *produced* some extremely interesting *results*, *in the domains of* language	+container	LANGUAGE IS A PLACE	Ontological, reference
	3	But I think that the traditional way of telling the Principles-and-Parameters story has outlived its usefulness.				
	4	For one thing, the traditional Principles-and-Parameters model is no longer compatible with the way minimalists think of Universal Grammar.				
	5	As I will discuss in some detail below, if minimalists are right, there cannot be any parametrized principle, and the notion of parametric variation must be rethought.				
	6	Second, it is fair to say that empirically the expectations of the traditional Principles-and-Parameters model have not been met (see Newmeyer 2005).	*throughout the grammar of* individual languages	+grammar +plural	LANGUAGES ARE ENTITIES	Ontological, entity
	7	Government–Binding theorists expected a few points of variations each with lots of automatic repercussions throughout the grammar of individual languages ("macro-parameters"), but they found numerous, ever more fine-grained, independent micro-parameters.				
4	1	In the limited space allotted to me here, I can focus only on the way in which central Minimalist tenets clash with the traditional Principles-and-Parameters approach.				
	2	I will have to leave a detailed examination of the alternative offered by the Minimalist Program to another occasion (see Boeckx in progress).				
	3	As for the empirical shortcomings of the traditional Principles-and-Parameters approach, I urge the reader to take a look at Newmeyer (2005: 77–103) to see some of the major difficulties the standard model faces and to appreciate the empirical task ahead.				
5		10.2 Two Ways of Approaching UG (and Parameters)				
6	1	To understand the current uneasiness				

		existing between Minimalism and the standard Principles-and-Parameters model it is instructive to go back to an important document of the GB era: Chomsky's introduction to Lectures on Government and Binding (Chomsky 1981: 1–16).	Chomsky *outlines* the Principles-and-Parameters approach that *was pursued* ever since and that Mark Baker *articulated in a very accessible way* in his *Atoms of* Language	+atoms	THEORIES ARE BUILDINGS	Structural, marginal, literal live
		There Chomsky outlines the Principles-and-Parameters approach that was pursued ever since and that Mark Baker articulated in a very			THEORIES ARE PERSECUTIONS	Structural, marginal, Literal live
	2	accessible way in his Atoms of Language (Baker 2001).			THEORIES ARE ROADS	Structural, imaginative live
					LANGUAGE IS A SUBSTANCE	Ontological, entity
		Chomsky makes clear that the appeal of the Principles-and-				
	3	Parameters model is that it provides a compact way of capturing a wide range of differences.				
		As he notes (p. 6), "[i]deally, we hope				
	4	to find that complexes of properties . . . are reducible to a single parameter, fixed in one or another way."		+values +diverse (quite) +passive		Ontological, entity
		This is clearly the ideal of Parametric	If these parameters are *embedded in a*		PARAMETERS ARE OBJECTS	Structural,
	5	Syntax.	*theory* of UG that is		THEORIES ARE	marginal, literal
	6	Elsewhere, Chomsky makes clear that this ideal depends on the richness of UG: "If these parameters are embedded in a theory of UG that is sufficiently rich in structure, then the languages that are determined by fixing their values one way or another will appear to be quite diverse [. . .]" (p. 4).	*sufficiently rich in structure,* then the languages *that are determined by fixing their values one way or another* will *appear to be quite diverse*	+rich +structure +unique	BUILDINGS VALUES ARE OBJECTS LANGUAGES ARE BUILDINGS	live Ontological, entiy Structural, marginal, literal live
		The starting assumption of Government-and- Binding was this:				
	7	"What we expect to find, then, is a highly structured theory of UG . . ." (p. 3).	it seemed that FL must be *rich,* highly *structured*, and *substantially unique*		THE FL IS A BUILDING	Ontological, identifying aspects
	8	In a recent paper, Chomsky (2007a: 2) makes this very clear: "At the time of the 1974 discussions, it seemed that FL must be rich, highly structured, and substantially unique."				
7	1	As Baker (2005) insightfully observes, the traditional Principles-and- Parameters model takes UG to be "overspecified."				
		This is perhaps clearest in Yang's (2002) model, where the acquisition task is reduced to choosing one	where the acquisition task is reduced to *choosing one* among		LANGUAGES ARE OBJECTS	Ontological, entity
	2	among all the fully formed languages that UG makes available.	all the *fully formed* languages that UG *makes available.*		UG IS A SELLER	Otological, personification
		In other words, the traditional				

	3	Principles-and-Parameters model is ultra-selectionist, guided by the slogan that learning (a little) is forgetting (a lot).				
8	1	Such an approach, relying on a richly structured UG, culminates in Baker's (2001) Parameter hierarchy (see Figure 10.1), a (partial) characterization of the dependencies among parameters (i.e. parametrized principles).				
9	1 2 3 4	The most obvious question that arises in a Minimalist context, where one seeks to go beyond explanatory adequacy, is, Where does the hierarchy come from? That is, What are the design principles that would make this specific hierarchy emerge? I do not know of any work addressing this issue. I suspect that this is due in part to the fact that Baker's hierarchy makes use of concepts such as topic prominence that have never been rigorously defined in a generative framework. The hierarchy also conceals layers of complexity (well known to practitioners in the field) in the formulation of serial verbs or pro-drop that would undoubtedly render the hierarchy more intricate and elaborate. But the lack of explicit discussion of Baker's hierarchy is also due to the fact that most syntacticians working within the Minimalist Program have shifted their attention away from rich, complex, parametrized principles, and toward the formulation of more basic operations (such as Merge and Agree).				
10	1 2	This is part of the shift that Chomsky (2007a: 4) characterizes thus: Throughout the modern history of generative grammar, the problem of determining the character of FL has been approached "from top down": How much must be attributed to UG to account for language acquisition? The M[inimalist] P[rogram] seeks to approach the problem "from bottom up": How little can be attributed to UG while still accounting for the variety of I-languages attained?	the problem of determining the character of FL has been approached "from top down" How much must be attributed to UG to account for language acquisition? How little can be attributed to UG while still accounting for the variety of I-languages attained?	+character QUESTION QUESTION	THE FL IS A PERSON	Ontological, entity
11/ p 209	1	As I write, the research program that approaches UG from below has generated a few interesting hypotheses regarding the nature of basic operations (such as Merge,				

	2 3 4 5 6 7 8 9	Agree, and Phasal Spell-Out) that are supposed to capture the essence of the core UG principles identified in the GB era. Such research has (implicitly) abstracted away from the fact that most principles in the GB era were parametrized, and has assumed that things pertaining to linguistic variation will fall into place once we understand the nature of principles. This research strategy was made possible by the perceived success of the traditional Principles-and-Parameters approach as a model solution to Plato's Problem. But it is important to note that the perceived success was not, or at any rate, need not be, dependent on the exact nature of parameters. What enabled the formulation of the Minimalist Program is the perceived possibility of segregating the universal from the particular (suggested by the gradual abandonment of language-specific, construction-specific rules in favor of parametrized principles), not so much the formulation of parametrized principles. In this sense, the traditional Principles-and-Parameters model did not go all the way, as it kept principles and parameters intertwined in the guise of parametrized principles. I think that some syntacticians nevertheless saw in this the possibility that one day principles and parameters could be fully segregated, which in turn warranted certain Minimalist moves. Be that as it may, I believe that recent developments within Minimalism make it possible to entertain the possibility of a truly universal, non-parametric syntax. Perhaps this is what Chomsky had in mind when he formulated the Uniformity hypothesis (Chomsky 2001: 2), given in (1).	(suggested by the gradual abandonment of language-*specific, construction-specific rules* in favor of *parametrized* principles)	+principles	LANGUAGE IS A BUILDING	Ontological, entity
12	1 2	*(1) Uniformity Hypothesis* In the absence of compelling	[HYPOTHESIS] assume languages to	+uniform +properties	THEORIES ARE PEOPLE	Ontological, personification

		evidence to the contrary, assume languages to be uniform, with variety restricted to easily detectable properties of utterances.	*be uniform*, with variety *restricted to easily detectable properties of utterances*	(of utterances)	LANGUAGES ARE OBJECTS	Ontological, entity
13 /p209 -210	1 2 3	Chomsky's formulation is not clear enough, as it fails to make precise what "easily detectable properties of utterances" are. Here I would like to entertain a strong version of the Uniformity hypothesis —call it the Strong Uniformity Thesis (SUT)—which states that narrow syntax is not subject to variation, not even parametric variation. In other words, there is only one syntax, fully uniform, at the heart of the faculty of language, underlying all languages.	In other words, there is only one syntax, fully uniform, *at the heart of the* faculty of language [FL], *underlying all* languages.	+syntax (only one) (uniform) +heart LANGUAGES ARE BUILDINGS	THE FL IS A LIVING ORGANISM	(Structural, marginal, literal live) Structural, marginal, literal live
14	1 2	(2) *Strong Uniformity Thesis* Principles of narrow syntax are not subject to parametrization; nor are they affected by lexical parameters.				
15/ p210	1	Under the SUT, points of variation (i.e. parameters) would be confined to the margins of narrow syntax, especially the morpho-phonological component (PF).3				
16 /p210	1 2 3 4	My reason for pursuing the SUT is that if Minimalist research is taken seriously, there is simply no way for principles of efficient computation to be parametrized. Contrary to what Baker and Collins (2006) seem to assume, it strikes me as implausible to entertain the possibility that a principle like 'Shortest Move' could be active in some languages, but not in others. Put differently, if Minimalist research is on the right track, there can be no parameters within the statements of the general principles that shape natural-language syntax. In other words, narrow syntax solves interface design specifications optimally in the same way in all languages (contra Baker 2008b and Fukui 2006). Modifying Marantz (1995: 380),	a principle like 'Shortest Move' *could be active in* some languages, but *not in* others [languages]. if Minimalist research is on the right track, there can be no parameters *within the statements of the general principles* that *shape* natural-language syntax. narrow syntax solves interface design specifications optimally in the same way *in all* languages	+-Shortest move +general principles +natural +syntax +narrow syntax +human +organ/faculty +recent (emergance)	LANGUAGES ARE PLACES THEORIES ARE VEHICLES STATEMENTS ARE CONTAINERS GENERAL PRINCIPLES ARE A NATURAL FORCE LANGUAGE (SYNTAX) IS A BUILDING NARROW SYNTAX IS A PERSON (DOER) LANGUAGES ARE PLACES	Ontological, reference Structural, marginal, literal live CONDUIT METAPHOR Structural, marginal, literal live Ontological, entity Ontological, personification Ontological, reference

	5 6	Minimalism can be seen as the end of parametric syntax. I believe that this conclusion is a natural consequence of the claim at the heart of the generative/biolinguistic enterprise that there is only language, Human, and that this organ/faculty emerged very recently in the species, too recently for multiple solutions to design specifications to have been explored.	that there is only language, Human, and that *this organ/faculty emerged very recently in the species,*		LANGUAGE IS AN ENTITY THE SPECIES (HUMAN) IS A PLACE	Ontological, substance/aspects Ontological, reference
17/ p210	1	10.3 Three Roads to Strong Uniformity				
18	1	I also believe that the SUT has become more realistic as a result of three recent developments in the Minimalist Program, to which I would like to turn now.				
19	1 2	The first development concerns our evolving conception of the lexicon in a Minimalist grammar. Readers familiar with the literature on parameters will no doubt have noted that the SUT is reminiscent of the conjecture first formulated by Hagit Borer, endorsed by Chomsky (1995), according to which "the availability of variation [is restricted] to the possibilities which are offered by one single complement: the inflectional component." (Borer 1984: 3)				
20 /p211	1	But like Chomsky's Uniformity hypothesis mentioned above, Borer's conjecture can be construed in more than one way:4 What counts as a lexical property? What is the lexicon, and where is it located with respect to other components of the grammar?				
21	1 2 3	Many (including Borer herself) found Borer's conjecture appealing because traditionally the lexicon is viewed as the repository of idiosyncracies (see Bloomfield 1933; Chomsky 1995). Since the lexicon is clearly the locus of learning, it makes sense to locate parameters there, since parameter settings must be chosen under the influence of the input the child receives. But recently, under the impetus of Hale and Keyser (1993, 2002) research, many aspects of lexical knowledge have been found highly principled, so much so that talk of a				

	4 5 6 7	l(exical) syntax has appeared feasible. This trend was continued by proponents of Distributed Morphology (Halle and Marantz 1993; Marantz 2000) and by Borer herself (Borer 2005). The net result of this line of research is that much of what we took to be a "messy" pre-syntactic lexical component has now been relegated to post-(narrow) syntactic areas, such as the morpho-phonological component (PF). The pre-syntactic lexicon has been considerably deflated, and very few opportunities remain for it to influence syntactic derivations in dramatic ways. (I return to these few opportunities in Section 10.4.)				
22	1	Such neo-constructionist or epilexicalist approaches to the lexicon provide the first theoretical development that virtually forces the SUT upon us: once parameters are confined to the lexicon, and much of the lexicon is relegated to post-syntactic components, there is little chance left for (narrow) syntax to be subject to parametric variation.				
23 /p 211-212	1 2 3 4	The second development I would like to highlight is the rise of the Unrestricted Merge model of syntax, beginning with Chomsky (2004a). It has been pointed out on numerous occasions that Minimalism is a research program and that there are multiple ways of exploring it. In what can be called the early Minimalist period (epitomized by Chomsky 1993, 1995), emphasis was laid on the Last Resort character of syntactic operations, as a way to reveal economy principles at work. The most productive way to conceive of syntactic operations being driven by Last Resort operations turned out to be to think of operations taking place to resolve some featural illegitimacy on specific elements (cf. principles like Greed, Attract, and the like). This led to a detailed examination of				

	5 6 7 8 9 10 11 12 13	what features can be found on lexical items, how these could vary, and so on. The number, type, and properties of features became the focus of attention in the literature now known as the Cartography approach. It is also at the heart of so-called Crash-proof syntax models. More recently, a few researchers (beginning with Chomsky 2004a) have begun to explore an alternative according to which syntactic operations apply "freely" solely in virtue of elements bearing "edge features." Such an approach vastly overgenerates, and must be supplemented with interface-internal conditions that filter out unwanted combinations (all of which, it must be stressed, are legible). In this way of looking at grammar, the edge feature boils down to the property of being a lexical item. Unlike the features that were used in the early Minimalist period, which varied from lexical item to lexical item, edge features are the common denominator among lexical items; they cannot be the locus of (parametric) variation. In other words, reliance on edge features has insulated narrow syntax from parametric effects. Syntax has become immune to the sort of lexical vagaries and idiosyncracies that could not be ruled out in the early Minimalist period.5				
24 /p212	1 2 3	The third development that I want to stress in this section concerns the growing suspicion that the mapping from syntax to sense (SEM) is architecturally privileged over the mapping from syntax to sound/sign (PHON). Until recently, models of grammar treated Phonetic Form (PF) and Logical Form (LF) symmetrically (think of the symmetry of the inverted-Y model), but for a very long time (going back to remarks by traditional grammarians like				

		Jespersen) it has been clear that there is quite a bit of variation at PF, but virtually none at LF. Thus, Chomsky (1998: 123) notes that PHON/PF "yield[s] a variety of morphological systems, perhaps superficially quite different in externalization of a uniform procedure of constructing an LF representation." As Mini- malists made progress in understanding the nature of operations internal to narrow syntax, it became clear that these were in some sense designed primarily to meet demands on the sense-side of the grammar (e.g. the elimination of unvalued/uninterpretable features).	there is a basic asymmetry in the contribution to language design of the two interface systems: the primary contribution to the structure of [the] F[aculty of] L[anguage] may be optimization of the C-I [sense] interface.	+design +asymmetry +interface systems (two) +structure +C-I [sense] interface	LANGUAGE IS A BUILDING THE FL IS A BUILDING	Ontological, entity Ontological entity
	4 5 5.1	Chomsky (2008: 136) puts it thus: It may be that there is a basic asymmetry in the contribution to language design of the two interface systems: the primary contribution to the structure of [the] F[aculty of] L[anguage] may be optimization of the C-I [sense] interface.				
25 /p212 -213	1 2 3	In other words, narrow syntax is optimally designed to meet demands from the meaning side, and externalization (PF) is akin to an afterthought, or appendix. Since variation clearly exists on the sound/sign side (an unavoidable consequence of the fact that this is that aspect of language that is used for communication and learning, and communication/imitation/reproduction is a more or less imperfect affair), but no evidence exists that it is found at the meaning side, it is not implausible to think of narrow syntax as completely uniform (meeting LF-demands), and not affected (design-wise) or adapted to cope with or code for variation in the guise of (syntactic) parameters. To put it differently, the LF–PF-asymmetry naturally leads one to expect a uniform narrow syntax, designed to meet the uniform demands at the meaning side in an optimal fashion.	this [sound/sign] is that aspect of language that *is used for communication and learning,*	+[sound/sign] +communication +learning +-imperfect +passive	LANGUAGE IS AN ENTITY (TOOL) LANGUAGE IS A TOOL FOR COMMUNICATION AND LEARNING	Ontological, identifying aspects
26	1 2	I should stress in closing this section that none of the three developments reviewed here provide incontrovertible evidence in favor of the SUT. They simply point to the fact that the				

		SUT emerges as the most natural hypothesis in the context of a Minimalist Program rigorously pursued.				
27	1	10.4 Parameter Schemata				
28	1 2 3 4	I pointed out in the previous section that various developments in the Minimalist literature conspire to make the SUT plausible. Architecturally speaking, there is little room left in a Minimalist conception of grammar for lexical parameters to affect narrow syntax. In this section I review a few proposals from the literature I am familiar with that characterize ways in which parameters may affect syntax. Following terminology suggested by Giuseppe Longobardi, I will refer to these as attempts to uncover parameter schemata.6				
29 /p 213-214	1 2 2.1 2.1.1 2.1.2 2.1.3 2.1.4	Perhaps the most detailed investigation in this domain comes from Longobardi himself. In a series of works (Longobardi 2003, 2005a; Guardiano and Longobardi 2005; Gianollo, Guardiano, and Longobardi in press), Longobardi argues that languages may differ in the following ways: (3) For a given language L, a. Is F, F a functional feature, grammaticalized? b. Is F, F a grammaticalized feature, checked by X, X a lexical category? c. Is F, F a grammaticalized feature, spread on Y, Y a lexical category? d. Is F, F a grammaticalized feature checked by X, strong?	Longobardi argues that languages may differ in the following ways	OUT OF TAXONOMY		
30 /p 214	1 2 3	Longobardi (2005a: 410–11) comments on (3) as follows. Question (3a) is meant to capture the fact that in some languages dimensions like definiteness are not marked on functional items like Determiners. Question (3b) boils down to asking whether a given functional head acts	that *in* some languages *dimensions* like definiteness are not marked on functional items like Determiners.	+dimensions (definiteness) +determiners	LANGUAGES ARE MULTIDIMENSIONAL PLACES	Ontological, identifying aspects

		as a Probe. 4 Question (3c) asks whether some feature F has an unvalued/uninterpretable variant participating in Agree-relations. Question (3d) is meant to capture that fact that in some languages 5 movement is overt, while in others it is covert. (It is worth pointing out that 6 Longobardi (2005a: 411) leaves open the possibility of a fifth parameter schema pertaining to pronunciation, of the sort familiar with pro-drop phenomena.)	*in* some languages *movement is* overt, while in others it is covert.	+ movement [overt, covert]	LANGUAGES ARE PLACES	Onrtological, identifying aspects
31 /p 214	1 2 3	The difference between (3b) and (3c) is not entirely clear to me (for a feature to be a Probe and be checked, it must Agree, hence "spread"), and once eliminated, Longobardi's schema converges with Uriagereka's (1995) characterization of his F-parameter in (4) (posited to capture effects at the left periphery of the clause, distinguishing Germanic from Romance, and also cutting across Romance varieties): (4) a. Is F present in the language? b. Is F strong?				
32 /p 214		Roberts and Roussou (2002) make a similar proposal when they propose the following parameter format: (5) a. Does F require PF-support? b. Is the support provided via Merge or Move?				
33 /p 214	1	Likewise, Borer (2005) puts forth that variation within the functional domain can be attributed only to the mode in which open values are assigned range: either via direct merger of a head, or movement of a head, or by insertion of an adverb, or by Spec–Head agreement.				
34 /p 214	1	As we see, there is a fair amount of consensus about the kind of parameter one finds in UG.7 The consensus boils down to a nested structure like (6).8				
35 /p 215	1 2	(6) Is F present/active in the language? Yes/NO If Yes, does F give rise to Movement, or simply Agree (/Merge)?	(6) Is F present/active in the language? Yes/NO	QUESTION		

36 /p 215	1	The nested character of (6) may prove useful in recapturing some of the effects of Baker's (2001) parameter hierarchy.				
	2	I will not explore this possibility further here, as I am skeptical regarding the adequacy of the first question in (6).	all languages *make use of the same pool of features,* and that	+features +active	LANGUAGES ARE PEOPLE (DOER)	Ontological, personification
	3	I think that all languages make use of the same pool of features, and that one of the ways in which languages differ is how they express the relevant feature F.	one of the ways in which languages differ is how they [languages] *express the relevant feature F.*	+feature F (relevant) +active +f1 +f2	LANGUAGES ARE ENTITIES LANGUAGES ARE PEOPLE (DOER)	Ontological, entity Ontological, personification
	4	Specifically, I submit (following Fortuny 2008, and Gallego 2008; see also Bejar 2003) that languages may choose to express f 1 and f 2 separately (analytically) or as a bundle (syncretically).	that languages *may choose to express* f 1 and f 2 separately (analytically) or as a bundle (syncretically).		LANGUAGES ARE PERSONS(DOER)	Ontological, personification
	5	This different way of thinking about the mode of parametrization available has the effect of breaking up the nested dependency expressed in (6).		+difference		
	6	Indeed I claim that the dependent question in (6) must be reformulated independently, namely as: Is F viral? (i.e. does F exhibit a uF variant?).	languages *may differ* in *whether a specific (phase-)head9 is strong (uF-bearing) or weak (defective).*		LANGUAGES ARE COMPUTING PROGRAMS	Ontological, identifying aspects
	7	Finally, languages may differ in whether a specific (phase-)head (9) is strong (uF-bearing) or weak (defective).				
	8	Notice that this way of formulating lexical parameters makes them interdependent; it does not single out one of the parameters as the one on which all others depend.				
	9	Notice also that the lexical parameters I put forward barely affect narrow syntax.				
	10	It is the same syntax whether f 1 and f 2 form a bundle or not.				
	11	It is also the same syntax whether a specific feature F is viral or not.				
	12	And, finally, it is the same syntax regardless of whether a phase head is weak or strong.10				
37 /p215	1	Of course, there are more ways in which languages may differ, but I contend that all other parametric options arise in the post-syntactic	*there are more ways in which* languages *may differ,*	+differences	LANGUAGES ARE ROADS	Structural, marginal, literal live

	2	morpho-phonological component, such as whether a head H allows its specifier to be filled by overt material, or whether the head or the tail of a chain can or must be pronounced, or whether a given head H is affixal and requires its expression in the vicinity of another head, or whether a head H precedes or follows its complements. These options arise at the point of Spell-Out, when syntactic structures must be linearized and the demands of (late-inserted) morphemes must be met.				
38 /p 216	1	10.5 Clustering Effects				
39 /p 216	1	The preceding section outlined a very impoverished version of a parametric theory, with parametric options isolated from one another and localized to specific heads.				
	2	Let me call these nano parameters,11 to keep them distinct from the more traditional octopus-like macroparameters that GB-research made famous (beginning with Rizzi 1982 and continuing with Baker 1996, 2001, 2008a).				
	3	Some researchers may find these wholly inadequate, unable as they seem to be to express the clusters of variation that are invariably brought up in the literature on parameters—especially the clusters that seem to align parametric values across independent heads (as the traditional head parameter does).12	the common impression […] that languages *can vary from one another indefinitely*,	+variation (indefinetely) +active	LANGUAGES ARE ENTITIES	Ontological, identifying aspects
	4	But although such clusters of variation did much to dispel the common impression (endorsed by structuralists) that languages can vary from one another indefinitely, it is fair to say that few of the implicational statements at the heart of traditional Principles-and-Parameters approach have stood the test of time.	Some languages indeed appear *to display the clusters the theory predicted*, but many languages *display only a few of the predicted clustering effects*;	+clusters +active +clustering effects (a few of) +active -clustering effects	LANGUAGES ARE PEOPLE (DOER) THEORIES ARE PEOPLE (DOER) LANGUAGES ARE PEOPLE (DOER)	Ontological, personification Ontological, personification Ontological, personification
	5	Some languages indeed appear to display the clusters the theory predicted, but many languages display only a few of the predicted clustering effects; more often than not, languages show no clustering effects whatsoever. (For this reason alone, nano	more often than not, languages *show no clustering effects whatsoever*.	+clustering effects -active	LANGUAGES ARE PEOPLE (DOER) ANOMALOUS	Ontological, personification

	6 7 8	parameters strike me as more adequate empirically.) Newmeyer (2005) is correct in stressing that the rarity of massive clustering effects takes much of the gloss away from the traditional Principles-and-Parameters model.13 Newmeyer goes on to suggest that clustering effects are just tendencies (probable, but not the only possible languages) to be captured in terms of performance effects, specifically parsing strategies.	that clustering effects are just tendencies (probable, but *not the only possible* languages) to___*be*___ *captured* in terms of performance effects			
40 /p216 -217	1 2 3 4	I think Newmeyer is correct in taking parametric clusters to be tendencies, not to be accounted for in terms of UG principles. But unlike him, I would like to suggest that these tendencies do not (always)14 arise due to parsing strategies. I propose that some are due to certain biases in the learning process. That is, I would like to suggest that the types of language that parametric clusters describe act as attractors as the child acquires her language, and that only a fair amount of positive counter evidence in the data leads the child to settle on a less homogenous system of parameter settings.15	*the types of* language that *parametric clusters describe* act *as attractors* as the child acquires her language,	+types +attractors	LANGUAGES ARE NATURAL FORCES LANGUAGES ARE OBJECTS	Ontological, identifying aspects Ontological, entity
41 /p217	1 2 3	In a nutshell, the guiding intuition I would like to pursue is that clustering results from the child seeking to maximize the similarity across parameter settings, harmonize their values, and thereby economize what must be memorized (via the formation of a generalization across similar parameters). My suggestion goes in the direction of a recent trend expressing a renewed interest in the nature of learning and the interaction between nature and nurture (see Yang 2002, 2004b, 2005; Pearl 2007). As Yang and Pearl have made clear (in a linguistic context; see Gallistel 1990b, 2006 for more general remarks on learning modules), a proper characterization of the learning task requires paying	(i) a defined hypothesis space (for language, UG),	+hypothesis	LANGUAGE IS AN OBJECT (OF KNOWLEDGE) UG IS AN OBJECT (OF KNOWLEDGE)	Ontological, entity Ontological, entity

		attention to three important components: (i) a defined hypothesis space (for language, UG), (ii) data intake, and (iii) a data-update algorithm.				
42 /p217	1 2 3 4	Yang and Pearl have shown in detail that there are certain data-intake filters or certain learning biases that must be assumed to characterize the language-learning task adequately. For example, Yang shows that the learner must be ready to tolerate a certain amount of noise within limits (which Yang takes to account for a variety of irregular, or semi-regular morphological processes). In a similar vein, Pearl has argued that the child must be ready to filter out potentially ambiguous cues for certain parameter settings. I would like to add to this a bias by which the child strives for parametric value consistency, a Superset bias with which the child processes the data, and which she abandons only if there is too much data contradicting her initial hypothesis.	*there are certain data-intake filters or certain learning biases* that must be *assumed to characterize* the language-learning task adequately	+data-intake filters +learning biases	LANGUAGE-LEARNING TASK IS A BY PRODUCT OF A COMPUTING PROGRAM	Structural, imaginative live
43 /p217	1 2	(7) Superset Bias Strive for parametric-value consistency among similar parameters				
44 /p217	1	For example, if the child learns that V precedes its complement and T precedes its complement, she will be inclined to hypothesize that the next head she encounters will also precede its complement, and will only reject her hypothesis if she finds enough positive counterevidence.				
45 /p218	1 2	The Superset bias should not look too unfamiliar: something very much like it is at the heart of the evaluation metric in Chomsky and Halle (1968). It may also underlie recurring intuitions in the domain of markedness (see e.g. Hyams 1986: ch. 6) and may help us characterize the notion of default parameter value (which Sugisaki 2007 shows does not fit well with other assumptions in a traditional Principles-and-Parameters setting).				
46 /p218	1	Finally, if it is on the right track, the Superset bias may reveal another economy principle at work in	the Superset bias *may reveal* another *economy principle at*	+economy principled(another)	SUPERSET BIAS IS A PERSON (DOER) ECONOMY	Ontological, personification

	2 3 4 5 6	language. But it is too early to speculate in this direction. We must first have a better handle on the range of variation that is allowed. Only then will we be able to study the superset bias with all the care that is required to characterize how much positive counterevidence is necessary for the child to choose a more marked option, etc. The take- home message for now is that if nano parameters are all we are left with in the context of minimalism, clustering effects—when they obtain!—will have to arise from something (or multiple things) external to narrow syntax. It seems to me that the learning process itself constitutes a natural place to look. It will certainly require closer collaboration between theoretical linguists and psycholinguists.	*work* in language.		PRINCIPLES ARE HIDDEN TOOLS LANGUAGE IS A PLACE	Ontological, reference
47 /p 218	1	10.6 Concluding Remarks, from a Biolinguistic Perspective				
48 /p218	1 2 3 4	This short paper is very programmatic, and I ask the reader to treat it as such. Many of my suggestions are very tentative, and await much closer empirical investigation than I have been able to provide here. But one thing, I hope, is very clear: the traditional Principles-and-Parameters model does not fit snugly with Minimalist intuitions. If Minimalist ideas are on the right track, the standard take on what would count as a solution to Plato's Problem (parameter setting in the context of an overspecified UG) must be rethought from the ground up.				
49 /p218	1	Although one finds relatively little explicit discussion of parametric variation in the Minimalist literature (other than the convenient appeal to a parameter whenever two languages diverge), I hope to have shown here that one can distill a program for parameters from the Minimalist literature—a Minimalist Program for parametric theory, as it were.	one finds relatively little explicit discussion of parametric variation in the Minimalist literature (other than *the convenient appeal to a parameter* whenever *two* languages *diverge*),	+parameters	LANGUAGES ARE PATHS	Structural, marginal, literal live

	2 3	It is one that leaves very little room for parameters (i.e. points of variation) to affect narrow syntax. This is not due to the fact that empirically syntactic effects of parameters are rare (the assumption in comparative syntax is that such effects are numerous and pervasive), but rather to the fact that syntactic parameters (i.e. parame- trized principles) make no sense within Minimalism.				
50 / p219	1 2 3 4 5	I believe that the Strong Uniformity Thesis in (2) emerges as a natural consequence of approaching UG from below, and with Galilean lenses. Consider, for example, Chomsky's (2005) claim that three factors enter in the explanation of language design:16 (i) the genetic endowment (1st factor), (ii) the environment (2nd factor), and (iii) generic good design principles transcending the limits of genetics (3rd factor). The third factor has played a prominent role in Minimalist research, and led to a much less specified view of the genetic endowment specific to language (UG). I have followed this trend here by suggesting that some effects formerly attributed to macroparameters may be due to a very general superset bias (economy guideline) relativized to the thing being learned (language). Invariably, as the importance of the first factor wanes, the interplay between the second and the third factors becomes more critical.	[The third factor] led to a much l*ess specified view of the genetic endowment* specific to language (UG). some effects formerly attributed to macroparameters may be due to a very general superset bias (economy guideline) relativized to *the thing being learned* (language).	+genetic endowment +thing +passive	FACTORS ARE PEOPLE LANGUAGE IS A BIOLOGICAL BEING LANGUAGE IS AN ENTITY	Ontological, personification Ontological, identifying aspects Ontological, entity
51 / p219	1	As I have argued elsewhere (see Boeckx 2006: ch. 4), I think that Minimalist guidelines suggest an architecture of grammar that is more plausible biologically speaking that a fully specified, highly specific UG—especially considering the very little time nature had to evolve this remarkable ability that defines our species. If syntax is at the heart of what had to evolve de novo, syntactic parameters would have to have been part of this				

	2	very late evolutionary addition.				
	3	Although I confess that our intuitions pertaining to what could have evolved very rapidly are not as robust as one would like, I think that Darwin's Problem (the logical problem of language evolution) becomes very hard to approach if a GB-style architecture is assumed.				
	4	Within GB, there is no obvious answer to why variation exists, and why variation takes the form that it does.	It is *because so little is specified* about language *in the genome*	+genome	THE GENOME IS A PLACE	Ontological, reference
	5	But with a considerably leaner vision of the faculty of language, variation becomes almost inevitable.	that *the varied, and ever-changing environment* gives us *variation in the externalized aspects* of language.	+external aspects	LANGUAGE IS AN ENTITY	Ontological, entity
	6	If very little about language is specified genetically, and much of the core of language (narrow syntax) is the result of third factor effects, variation emerges as the direct result of underspecification.			THE ENVIRONMENT IS A PERSON	Ontological, personification
	7	It is because so little is specified about language in the genome that the varied, and ever-changing environment gives us variation in the externalized aspects of language. To take an obvious example, it is because Merge is symmetric that both head-first and head-last are possible options.			LANGUAGE IS AN ENTITY	Ontological, entity
	8	Once a symmetric structure has to be broken by sheer force of the physics of speech, two options are logically available if no restriction has been pre-imposed.17				
	9	(A richer syntax could have specified a rigid head–complement order, as in Kayne 1994.)				
52 /p220	1	This is not to say that we are back to the structuralists' claim that anything goes across languages.	*anything goes across* languages.	+anything	LANGUAGES ARE PLACES	Ontological, reference
	2	Narrow syntax sets the limits of variation (no language will have ternary branching structures if binary branching is a third factor effect; ditto for minimality, the size of phases, etc.), but within these limits, there will be variation.	Narrow syntax *sets the limits of variation (no language will have ternary branching structures* if binary branching is a third factor effect; ditto for minimality, the size of phases, etc.)	+branching structures	NARROW SYNTAX IS A PERSON (DOER) VARIATION IS A PLACE LANGUAGE IS A BUILDING	Ontological, personification Ontological, reference Structural, conceptual imaginative live
		And there will be a lot of it, more than GB-practitioners expected, but probably as much as the detailed				

	3	empirical work spearheaded by Richard Kayne continues to reveal (for a representative sample, see Manzini and Savoia 2005).				
	4	Norbert Hornstein has pointed out (Hornstein 2009) that there are many geometrical figures one can draw with a minimal set of tools like a straight edge and a compass, but there are some (e.g. triangles with 20-degree angles) that are impossible.				
	5	The gappiness of the linguistic morphospace may have to be accounted in exactly these less specified, but no less deterministic terms.				
52/ p220	1	We seem to have reached a stage where the current leading idea about how Darwin's Problem could be solved forces us to reconsider what we took to be our very best bet concerning Plato's Problem.				
	2	It is true that selectionism has now a distinguished history in biology and that parallelisms between a GB- style, richly-specified UG, and current work in developmental evolutionary biology (evo–devo) are not too hard to find.18				
	3	But one must bear in mind that the role of epigenetic factors in biology is on the rise (see Jablonka and Lamb 2005), and that the selectionism often invoked in evo–devo is in aid of understanding what Gould (1989) called "disparity" (fundamental design differences, as opposed to superficial diversity).	COMPLEX *in the context of* language, we are dealing with *a single design, a single organ, in a single species.*	+context +design +organ +species +diversity	LANGUAGE IS A PLACE LANGUAGE IS A BUILDING LANGUAGE IS AN ORGAN	Ontological, reference Structural, marginal, literal live Structural, marginal, literal live
	4	One must bear in mind that in the context of language, we are dealing with a single design, a single organ, in a single species.	*With* language, *there is* no disparity to speak of, only *very superficial diversity*.	+no diversity (of design)	SPECIES IS A CONTAINER LANGUAGE IS AN ENTITY	Ontological, reference Ontological, identifying aspects
	5	With language, there is no disparity to speak of, only very superficial diversity. Evo–devo seeks to understand the diversity of design by revealing a design of diversity, but there is no diversity of design in language, as 50 years of hard work in generative grammar have revealed.	but *there is no diversity of design in* language, as 50 years of hard work in generative grammar have revealed.		LANGUAGE IS A PLACE	Ontological, reference
	6	Accordingly, the analogy between UG and the universal genome should not be pushed too far, certainly not in the direction of an overspecified UG,				

		I think.				
53 / p221	1 2 3	Inspired by recent developments in Minimalism, I have sketched an approach that I hope captures the outline of the nature of linguistic variation in a more adequate way. The line of argument advocated here provides an answer to why variation exists, and why there is so much of it (but so little in narrow syntax proper). It relates the answer to other current themes in biolinguistics that stress the non-genomic character of nativism, and the formal simplicity of the language organ.	the *formal simplicity of the* language *organ.*	+simple	LANGUAGE IS AN ORGAN	Ontological, identifying aspects
54 / p221	1 2 3 4 5	If the approach suggested here is on the right track, narrow syntax shows no sign of design compromise to assimilate variation, and thus provides another piece of evidence in favor of the PF–LF asymmetry recently emphasized by Chomsky. Variation is not structurally encoded (in the form of a parameter hierarchy); instead it is the result of the lack of structural encoding. It arises exactly where we expect it: not where third factors reign (narrow syntax), but where the second factor plays a prominent role (externalization). Nevertheless, variation tends to show signs of optimization in its organization. As a matter of fact, in the present context, parameters emerge as a mini–max solution (as Noam Chomsky and Massimo Piattelli-Palmarini have speculated): an attempt to navigate between the path of least genetic specification (minimal UG) and the path of least instruction (superset bias).				
55 /p221	1 2	The few suggestions I made in this chapter quickly reveal the vastness of the empirical research program that lies ahead. In many ways, we have not begun to solve Plato's problem (not even abstractly). Since the standard assumption in the field is that there is a lot of syntactic				

	3 4 5	effects out there (the topic of the rich field of comparative syntax), and the main claim of this chapter is that syntactic variation does not exist, many data points will have to be reanalyzed. I suspect that much of what we thought was syntax will turn out to be morpho-phonology (in the same way that the syntactic notion of timing of movement (overt vs. covert) has been replaced by a PF pronunciation algorithm that picks a certain copy in a movement chain). Like GB principles, GB parameters may turn out to be epiphenomena, to be understood as the result of deeper forces.				
56 /p221	1 2 3 4	It is sometimes said that minimalism has not engendered important empirical discoveries (see Pinker and Jackendoff 2005; Koopman 2000). Nothing could be further from the truth, if we bear in mind that the empirical focus of generative grammar and biolinguistics is the language faculty, not specific constructions in languages. If we find efficient design in language, that is a surprising empirical discovery. Likewise, if we find a truly uniform syntax, if indeed it turns out that there is no syntactic variation at all, that too would be a startling empirical discovery, considering that only fifty years ago Martin Joos could write with assurance (Joos 1957) that the range of variation in this realm was virtually infinite.	that t*he empirical focus of generative grammar and biolinguistics is* the language faculty, *not specific constructions in* languages. If *we find efficient design in* language, that is a surprising empirical discovery.	+specific constructions +design	GENERATIVE GRAMMAR IS A PERSON BIOLINGUISTICS IS A PERSON THE FL IS AN OBJECT (OF KNOWLEDGE) LANGUAGES ARE PLACES LANGUAGE IS A PLACE	Ontological, personification Ontological, personification Ontological, entity Ontological, reference Ontological, reference