

# **WHY THE LINGUISTIC BEHAVIOUR OF MODERN HUNTER-GATHERERS IS THE MOST RELEVANT EVIDENCE FOR THE LANGUAGE FACULTY WHICH INFORMS INQUIRIES INTO ITS EVOLUTIONARY EXPLANATION**

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## **ABSTRACT**

The present article argues that modern linguistic theorizing has been highly influenced by modern Western thought by assuming that the languages of highly advanced societies, i.e. communication systems tailored to the needs of modern civilization, represent natural language as the hallmark of human species and extrapolated from these the features of the Language Faculty.

This biased approach has directed the search for the language faculty in a wrong direction, confusing products of evolution with the fruits of advanced civilization. In an effort to minimize this bias I argue that the linguistic output of the average hunter-gatherer is the most relevant source for understanding the Language faculty and sheds light on its evolution.

keywords : Language Faculty, writing , linguistic theory, language evolution, languages, communication

## **INTRODUCTION**

Modern civilization is indisputably beneficial for humanity. Its most spectacular achievements are based mainly on the human cognitive ability to form abstractions. From mathematics, IT technology, social institutions, modern life is built on abstractions. Most importantly, abstractions are not solely in our minds but have become part of our modern reality, i.e. humans have reinvented reality which has become part of our material experiences by blending matter and mind. The rise of civilization has brought the invention of social reality of institutions, as described by Searle J. (1997). Today we live in our invented reality which is in many ways removed from the experience with the natural world of pre-civilization environments. Thus, human cognitive power of abstractions by countless number of generations of thinkers and experimenters has resulted in our modern reality which is removed far away from the reality of the natural world.

On the other hand, our minds are inevitably formed by our experiences and , as we reinvent our notions of reality by blending ideas and matter, at the same time this invented reality becomes part of our experiences and influences back our perceptions and cognition. All minds are biased. Minds of civilized humans reflect the bias of this new reality, from religious ideas to science and philosophy, we project our tendency to view the world in terms of abstractions. Most importantly, our experience with civilization influences our conceptualization of reality most clearly illustrated in rationalist philosophy and formalization of scientific inquiries where reliance of abstractions percolates scientific argumentation from premisses to conclusions.

The philosophical roots of such ideas lie in Descartes philosophy of innate ideas, which

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assumes the authority of God in the structure of human cognition and excludes experience with the world at large as a factor. Our modern thought is highly influenced by the rationalist philosophy of Plato and Descartes. Rationalists state that the only reliable source of knowledge is through the rules of logic. Rationalistic theories aim at discovering eternal truths. In that they adopt the philosophy of Plato and Descartes. In rationalistic or formal theories knowledge of the eternal truths are discovered by the methodology of introspection and intuition, for which facts of reality, by definition external to the mind, are deemed irrelevant. The conceptual machinery is based on highly abstract preconceived notions grounded in principles of mathematics and logic. Reality is understood as composed of idealized types or essences with abstract properties, known as essentialist. That is, generalizations from evidence are deemed unnecessary and are replaced by abstract models. Formal theories follow the rationalist philosophy in assuming an abstract and static reality and describe the world as preconceived data where the object of study is represented in abstract notions on which models are formulated, and evaluate the factual reality by imposing such models on it.

In this context natural phenomena are deliberately altered to fit into preconceived abstract models before subjected to experimentation. In other words “Nature is cross-examined through experimentation, as if in the court of law, in the name of a priori principles... and answers are assessed in term of the very idealizations that guided the experiment. All the rest does not count as information.” (Prigogine I., Stengers I. *ibid*, p.42).

The job of a scholar is said to “...to manipulate physical reality, to 'stage' it in such a way that it confirms as closely as possible to a theoretical description. The phenomenon studied must be prepared and isolated until it approximates some ideal situation that may be physically unattainable but that conforms to the conceptual scheme adopted.” (Prigogine I., Stengers I., 1993, p.41). Data which put into question the formal theoretical preconceptions are either disregarded as irrelevant, or interpreted in a way which makes them fit the formalism. The goal of formal theories is to perfect the formalisms.

Moreover, humans' conceptualization of reality is biased by cultural prejudices and as such reflect cultural values which, inevitably, influence and shape our reasoning, and by association, our theorizing. This is the view of Michel Foucault, who, as paraphrased in Gould S.J. and Vrba E. (1982) wrote: “...when you know why people classify in a certain way, you understand how they think...” (ibid, p. 4). Thus, the way we label nature reflects our values as participants of a culture.

Moreover, logical reasoning is not universal, it is influenced by culture.

“The social – psychological aspects of Ancient Greek and Chinese life had correspondences in the systems of thought of the cultures. Their metaphysical beliefs were reflections of their social existences... These result in very great differences between Greece and China in their approaches to scientific, mathematic, and philosophical questions.” (Nisbett et al., 2001, p. 293).

Science is activity of human beings who are also members of society and as such reflect social and cultural values and viewpoints. Science has never been independent of social life. Resent

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developments in science could only happen in the specific cultural and historical circumstances which prompted them. Chomsky's computational theory of language and human mind was dominant in the decades following the discovery of computation by Alan Turing and the proliferation of computing technology. The influence of Turing's theory has proliferated all aspects of modern life and even our perceptions. Today even human sensation and emotions are defined in digits as we are asked to rate on a scale of 1 to 10 the intensity of a headache or our impression of a house.

This anticipation of discreteness and abstraction is clearly demonstrated in modern linguistic theorizing. Chomsky defines natural language as a set of abstractions while at the same time defines these as part of human biology as knowledge of language. He also has consistently stated that the rules of grammar are highly abstract, which makes them unlearnable, justifying the argument for their innateness (Chomsky, N. 1972, 1980, 1986, 1988 and elsewhere).

That said, abstract entities are by definition not material objects and definitely not biological entities. In disagreement with Chomsky's views Postal P. (2012) argues that objects in the material world are necessarily distinct from the knowledge of them. The former is material and part of the material reality, the latter is abstract, i.e. metaphysical. From philosophical perspective material objects have ontological reality, while the knowledge of them does not.

This is not to deny the crucial role abstractions play in scientific inquiry as in the process of formulating a theory as abstract model of reality, one necessarily must disregard certain non-essential properties of the object of study. Thus, the conversion of the physical into metaphysical is an essential tool science.

Nevertheless, as Postal (2012) remarks that "...Abstracting away from certain features of physical things within a theory formation process cannot alter their physical nature. No process of abstraction could lead from something biological to set-theoretical characterizations" (Postal, P. *ibid.* p. 10). Thus, one must not be replaced or mistaken by the other and entities cannot be material and abstract at the same time.

But what Chomsky advocates is exactly that, "...impossible transformation of physical things into abstract ones." (Postal, P. *ibid.* p.10-11).

Even more contradictory is the minimalist understanding of language as infinite recursion as infinitude cannot be a characteristic of material things as material entities are always finite. Even a Turing machine is a material entity made of material parts which wear off and need replacement. The limitations of material entities are most clearly obvious in biological entities. So if language is defined as a biological entity, an organ of sorts, similar to the lungs or the heart, as Chomsky insists, it cannot be infinite. Infinitude of biological matter would imply immortality.

Chomsky's answer to criticism on the infinitude argument is that infinitude of human linguistic recursion is a potential, expected to eventually become a reality given enough evolutionary time. That said, given the inherent limitations of all material things and biological resources, infinitude of biological potential is an unrealistic expectation as one cannot evolve one's way to immortality.

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From a different but related perspective, Chomsky and other generative linguists position their ideas of language in the field of philosophy, not science. That said, Philosophical convictions are truths established by scientific findings and change with new scientific discoveries, not religious dogmas, which are fact-free, irrefutable and eternal. Philosophy relies on science. Philosophical convictions of language capacity must be based on scientific findings and change with new discoveries. Philosophy of language must follow the science of language. In this sense the generative views are criticized also by prominent philosophers. J. Searle has argued extensively against understanding of the human mind in terms of computation and programming ( Searle, J. 1980). Pinker S. and Fodor J. were engaged in a debate over the understanding of the human mind in terms of Turing computing machine. Pinker wrote the book How the mind works ( 1997) in which he defends the computational theory of mind . In response to Pinker J.Fodor wrote the book The mind doesn't work that way, the scope and limits of computational psychology,( 2000) where he debunks Pinker's argument. In this context the generative statement of linguistics as a natural science where the object of study is defined by properties which reflect the confusion of material and abstract, physical and metaphysical, is confusing to say the least.

In the following article I will argue that modern linguistic theorizing , which reflects modern western thought defined by a tendency to form abstractions. Moreover, under the influence of Chomsky the generative/biolinguistic paradigm defines natural language by a confusion of material and abstract. In this context the language system is identified as the language of modern complex civilization, with abundant abstract concepts and principles of association . Moreover, the gap between physical and ideal in generativism , i.e the interface of physical and abstract is bridged by the concept of the ideal language speaker and its material incarnation in the highly educated , linguistically trained westerner. In addition, the spontaneous evaluations of grammaticality of the educated westerner/ideal human speaker are the empirical support for the postulation of the human Language Faculty.

This biased approach has directed the search for the language faculty in a wrong direction, confusing products of evolution, material entities, with the fruits of advanced civilization, . To neutralize this bias I propose the languages of pre-civilization communities of modern hunter-gatherers to be considered the most relevant factual basis for defining natural human language and extrapolating the language faculty.

## 1. Biases of modern civilization influence linguistic analysis

Experience with language informs our conceptualization of language. In modern societies our experience with language is mainly through writing .

### 1.1. Linguistic analysis and writing

Linguistic communication exists in two forms, in informal spoken dialogues and in writing..Language has existed in spoken form ever since its origins, some 200 000 years ago.Writing is a recent human invention. The oldest writing systems known to science are about 6000 year old.

Spoken dialogues and written texts are each organized by very different principles. In

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linguistics these differences are reflected in Saussure's linguistics by the dichotomy of langue, i.e. the abstract system underlying language use, and parole, the material realization of this abstract system in spoken dialogues during its use in communication. Langue is defined on the basis of written texts and has been the focus of linguistics as parole has been deemed uninteresting for serious scientific inquiry. Thus, linguistic analysis and linguistic paradigms reflect language as a product of culture and advanced civilization.

Written texts are defined by the following characteristics:

- \* Written text is composed of discrete and visibly distinguishable basic units, the letters of the alphabet which are spatially organized
- \* Letters are static and atemporal units.
- \* They are organized in spatial patterns according to syntactic rules and conventions of punctuation.
- \* The meaning conveyed by written text is context-free, the meaning of the sentence is the sum total of the meanings of the component words. As the immediate context is missing the message must be maximally explicit.
- \* Written communication is well suited for monologues where the communicating parties are separated in space and in time, in monologues information is given, but there is no information exchange.
- \* This makes written language perfectly suited for disseminating abstract knowledge declarative speech acts dominate the written discourse.
- \* As such it reflects much less the idiosyncrasies of the local culture, so written language is removed from everyday life and is suited for exposition of timeless ideas. So, the information conveyed by written language is constrained semantically.
- \* It is tightly organized following strict rules and conventions of grammatical correctness, tolerates little variation of personal style, that is, the grammar of written texts is prescriptive, not descriptive.

Mastering the rules of written language requires extensive and deliberate learning and instruction.

In short, written language is self-contained, it is a code. It has autonomy from the idiosyncrasies of time and place in interpersonal linguistic interactions.

In Saussurean linguistics the visualization of the linguistic structure is achieved by the use of the Roman alphabet. That is, phonological segments, vowels and consonants, are marked by letters of the Roman alphabet. The graphic representation of the word in morphology and syntax are marked by Roman letters and their boundaries are marked by empty spaces. In syntax the boundaries of the sentence are marked by capital letters and punctuation marks. The timeless, stable, object-like nature of the linguistic structure is considered particularly suitable for building formalisms. The dynamic and flexible nature of language demonstrated in speech is therefore, ignored and excluded from consideration.

This visual representation of language in written texts informs its conceptualization as composed of discrete building blocks which stand in fixed relations with one another and have existence independent of their users.

The written language bias is evident in the two major perspectives on language: the generative

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perspective views grammar as innate property of the human mind while the usage-based/ complexity perspective defines language as emergent from behaviour. That said, they both have as the object of study a language system based on writing. The difference between the two is that the former explains the language system with the internal organization of the human brain while the later explains it with convergent of community preferences in language use. This is most clearly articulated in the performance-grammar correspondence hypothesis ( Hawkins 2007).

## 1.2. Linguistic analysis and programming languages

In the era of computation language has been interpreted as a computation system based on algorithms, i.e. artificial language-like symbolic codes. The most influential in the past few decades has been the generative paradigm associated with the name of Noam Chomsky. He, after inheriting the structuralist vision of language as idealization and abstraction from parole, has added a new aspect to it. The generative vision of language is based on principles borrowed from Turing's theory of computation which defines decision making in terms of binary choices between 0 and 1 by using a machine, a digital computer which makes decisions by following instructions of an algorithm, i.e. a code composed of rows of digits of 0s and 1s. Similarly the generative paradigm defines language as a computation system which builds sentences out of binary choices between discrete elements. As Chomsky has famously stated, to paraphrase, there is a sentence with 4 words, 5 words, but there is no sentence with 4,5 words. So discreteness is pointed at as the defining feature of language, notwithstanding that there is no consensus on how to define a word. Chomsky and collaborators define language in terms of computation as symbolic structure of infinite length and complexity under arbitrary principles of organization. Importantly, the concept of recursion, identified by Hauser M., Chomsky N., Fitch T. (2002) as the only unique property of language is borrowed from computer science.

The generative paradigm understands language as grammar. The sentence is the centre of inquiry and is defined as the codified expression of a complete thought. The sentence is understood as a complete (non-elliptical) grammatical structure with clearly defined discrete components, i.e. grammatical categories, e.g. noun, verb, adjective, etc. organized into phrases, arranged into clauses and sentences following abstract predetermined principles of well-formedness.

The shape of grammar is said to be innately represented in the mind of the ideal speaker with idealized linguistic abilities, determined by the impulsive judgements of western educated professionals, often professional linguists, deemed to be incarnations of the ideal speaker. Crucially, the linguistic abilities of the ideal speaker are extrapolated to represent the Language Faculty of every human as a hallmark of the human species.

On the other hand, corpus-based inquiries of spontaneous linguistic behaviour of average speakers of natural languages by studies linguists who subscribe to the usage-based /functionalist perspective demonstrate that linguistic forms a continuum with lexical words with concrete meanings and highly abstract grammatical forms occupying the opposite extremes of this continuum (Bates, E., Goodman J. 1997). The very concept of word is fuzzy

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which blurs the distinction between syntax and morphology, suggesting a continuum in grammar. The continuity of linguistic forms is pervasive in all languages, that is, it is a universal property of languages ( Haspelmath , M. 2011 )

The continuity of linguistic forms is reflected in language processing and learning by the normal brain of the average speaker (Bates,E., Goodman J. 1997).

In sum, the computational view of language is based on idealizations extrapolated from artifacts produced by complex civilization and as such does not reflect the features of natural languages despite being predominant in modern linguistic thought.

### 1.2.2.Computation of meaning

Structuralism defines meaning as system-internal and autonomous, , that is, independent of outside reality and speaker interpretation. In generativism principles of computation have been co-opted for understanding linguistic meaning. In generativism meaning is represented in terms of stable, timeless and objective ( disembodied) basic concepts , or meaning primitives, which combine by predetermined rules and form hierarchically organized semantic structures. Semantic primitives are discrete, object-like entities which, if combined according to rules, form “ correct” semantic representations. Word meanings are defined as literal meanings and are fixed one-to-one mappings of meaning and form. They are stable, finite and timeless sets of discrete semantic features. That is, semantics of natural language is algorithmic. So, some of the fundamental properties of language are ignored and natural language and human minds are represented in terms of artificial constructs.

### 1.2.3. Semantics as logic

Logic is a set of criteria for rational thinking. It is a product of advanced stages of human civilization. Semantics is the interface between thought and language. In the generative paradigm the semantics of natural language is understood as a branch of formal logic. The meaning of a sentence is a statement and is defined in binary features as either true or false. The interpretation of linguistic meanings is defined as correct if it is in accordance with strict rules of interpretation, borrowed from logic.

The meaning of a sentence is analyzed in terms of fixed semantic categories the most basic of which are agent, object, action, location, property, etc. which combine by strict predetermined rules and is evaluated in terms of truth conditions. To remind, truth conditions are the conditions under which the statement expressed by the sentence is true, i.e. refers to some fact of extralinguistic reality.

This conceptualization of linguistic meaning reflects the underlying understanding of language as rule-governed, combinatorial system with mainly ( if not exclusively) intellectual functions of informing about the state of reality. So, the semantics of natural language is also understood as computational( Katz,J., Fodor, J.1963)

This, essentially cognitive function of accurate description of reality, is communicated by written texts . The interpretation of linguistic meaning is that of the ideal speaker and the expert observer. As such it misrepresents the semantics of natural language in various ways. For

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once, it only studies thought encoded in statements, while questions are not entertained . In addition, natural linguistic communication is not always rational and not always meant to be truthful.

In short, formal logic is a strait jacker into which linguistic meaning is forced .

To recap, modern linguistic theories define natural language in the image of written texts and programming languages, both of which represent a distorted image of natural language as the uniquely human communication system .

### 1.3. On writing and language complexity

Language is referred to as a highly complex system, although complexity in language is an ill-defined concept. It depends how one defines grammatical complexity: complexity of grammar means for some multiple embedding of phrases and sentences, i.e. syntactic recursion, for others, abundant use of irregular grammatical forms. Both types are exemplified by languages with long written traditions. Writing encourages grammatical complexity as multiple embedding ( recursion) of phrases and sentences given its main purpose to articulate in detail complex ideas and make them understandable to people with different backgrounds and world views, to defend or rebuke arguments in various spheres of public discourse.

Writing implies complex culture and semiotic complexity which comes with it. That said, rich semiosis is usually encoded by extensive vocabulary for which complex grammar is not really necessary, demonstrated by the fact that the same meaning can be encoded in language systems with highly abstract grammatical forms, e.g. Latin, and highly irregular grammars , e.g. Russian, and others with higher regularity of forms, e.g. Turkish, which makes translation possible. Moreover, studies in historical linguistics and typology show that there is nothing particularly indispensable about the use of grammatical forms as hierarchically organized conceptual structures can and are, in many languages and in the same language at different time periods, externalized in alternative ways. ( Comrie, Kuteva 2005; Heine, Kuteva, 2007)

## 2. The structure of spontaneous informal conversations

The bulk of linguistic communication is universally conducted in informal, spontaneous dialogues which reflect authentic language in use by both educated and illiterate speakers. Linguists usually consider informal linguistic communication unstable, unruly, unsystematic and unsuitable for serious study and for these reasons is rarely the topic of serious study. Nevertheless, informal dialogues are not less systematic and display universal distinctive characteristics as follows:

\* Meaning-based, not grammar-based, i.e. , organized around information structure ( topic vs. focus).

\* The standard meanings of lexical items are creatively interpreted in unique ways and most often the intended meaning is different from the one interpreted.

\* Most utterances are not full sentences but fragments, phrases are also fragmented. Elliptical and abbreviated forms abound. The hierarchical structure of thought is usually not explicitly represented in linguistic forms and what is not explicit is implied. Incomplete structures whose

omitted components can easily be recovered from the context are abundant.

e.g. “ This one”. “Not now”.

\* The omission of grammatical markers, which do not contribute to meaning and have only structural values, for example definite and indefinite articles in English, is one of the most notable characteristics. Despite these structural gaps the complete meaning of the utterance can be successfully recovered from the context.

\* Small clauses, almost complete lack of embedding of phrases and sentences is the norm. Some elements of the grammatical details , e.g. markers of plurality , modality, tense , aspect markers, case markers in languages with detailed case systems ( German , Russian, etc) although present, are greatly simplified.

\* Grammatically defective elements of unclear syntactic features, unclear morphological class and irregular phonology, or in Jackendoff's terms 'defective items' ( Jackendoff R. 2002) , 'mm', 'wow', 'sht' are frequently used.

\* Informal conversations depend heavily on shared knowledge and as such are rarely explicit. Because of that the adequate understanding of the intended message is assured by the continuous use of supplementary non-verbal signals, for example facial expressions, gesticulation, etc. Spoken language is a component of a complex communicative act , where all components plays a role in synchrony.

\* Informal conversations are normally dialogues, i.e., involve at least two participants , a speaker and a listener, who are physically present active participants and the immediate context of the conversation.

\* The interpretation of meanings depends on the participants' background knowledge, who usually share a considerable amount of information about the world, i.e. common ground. That said, individuals' common ground is never identical as speakers are unique individualities. This is why the meaning intended by the speaker is usually different from the meaning understood by the listener.

\* The two communicating parties constantly supply one another with feedback and adjust their attitudes accordingly, thus, informal communication is interactive and cooperative. Participation in dialogues requires knowledge of the rules of conversation, i.e. Grician principles of cooperation in communication.

\* Frequent use of expletives.

\* Spontaneous informal dialogues are realized in real time under the pressure to make one's thoughts explicit in short time, given the vocal signals are ephemeral.

\* This means that communicators do not have time to think about grammatical correctness which explains the frequent omission of grammatical markers:

ex. ”Need gas?”

\* Because during spontaneous conversations there is no time to find the exact word, the use of words and phrases with vague meanings like 'that thing', ' the guy', ' that fellow' , 'people' are abundant.

\* Extensive use of intonation as a replacement of grammatical devices, for example in questions.

\*All types of utterances : questions, exclamations, statements, are found in informal systems.

\* Formulaic expressions are often used.

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ex. “ Sorry to hear that .” “ Good morning”

In sum, the spontaneous linguistic output of the average human speaker displays universal characteristics. It is quite different from preplanned linguistic output of linguists used in professional setting. Although it seems unsystematic, vague and unruly, it displays its own regularities and is a system on its own.

## 2.1. The languages of pre-literate societies

The conceptualization of language by the prominent linguistic theories is biased as they are based on modern western civilization. On the other hand, pre-linguistic, isolated communities of hunter-gatherers, unaffected by the influence of modern civilization, conceive of the material reality in ways vastly different from what modern thinkers anticipate as a default. This is reflected in their language systems. The linguistic behaviour of speakers in pre-literate communities demonstrate that language cannot be understood by mathematical calculations or other preconceived notions furnished by modern western thought.

Cysouw M. and Comrie B. (2013) outline some structural typological similarities among a number of languages spoken by small hunter-gatherer communities in Australia which are summarized as follows:

- \* lack of dominant order of sentence constituents, word order is notoriously flexible and where there is such, it is non-SVO
- \* lack of adpositions, a few postpositions
- \* no dominant order of noun-genitive, preference for genitive-noun
- \* interrogatives in initial position
- \* subject clitics
- \* small phonological inventory

The authors underscore that the outlined structural features are only statistical preferences, not obligatory. Such poorly organized systems suggest pervasive ambiguity problem. Naturally, the lack of stable structure is compensated by significant reliance on contextual clues for the disambiguation of the message.

Piraha is another rare example of a language untouched by modern civilization. D. Everett (2005) has studied the language of an Amazonian tribe Piraha and describes it as follows:

- \* Piraha grammar is designed to capture immediate experiences, that is, no detachment from here-now, no past tense marking, folk tales are descriptions of experiences of direct observers of events,
  - \* no embedding of phrases and sentences
  - \* the simplest pronoun inventory
  - \* women use simplest phonological inventory known. In addition, Pirahas use extensively prosody as well as non-verbal vocalizations, humming, whistling, singing.
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\* no semantic quantifiers, e.g. all, most, some, each, etc.

In the lexicon: no colour terms, no numerals, the simplest kinship system .

Unlike the above-discussed languages of small tribes of hunter-gatherers Riau Indonesian is spoken by a large population of various millions in Sumatra. David Gil, ( 2007) describes Riau Indonesian , a colloquial variety which “ represents the limiting points of maximal simplicity within each of the three distinct domains , morphology, syntax and semantics.” ( Gil, D.ibid. p. 2) He defines it as Isolating-Monocategorical-Associational ( IMA). Morphologically isolating means that words have no internal structure, that is, no morphology, so each word is a stem. Syntactically monocategorical means that there are no syntactic categories, that is, there is no distinction of parts of speech and any word can be noun or verb, or something else and belongs to one category, the sentence . Riau is not a pure monocategorical language as , the author reports that it has a few words with grammatical functions. It is not purely isolating language as it has a few affixes, it also displays compounding and reduplication. It is also semantically associational, which means that compositional semantics is based on the so called “association operator” ( A) which signals that in an utterance containing two words the meaning of the utterance is interpreted in terms of some form of association between the two word meanings.

Thus, the language systems which exist exclusively as spontaneous spoken dialogues display some common characteristics: they rely on pragmatic factors more than on grammatical ones for comprehension, use basic vocabulary of mainly noun-like and verb-like words in their simplest forms as bare stems, usually juxtaposed according to semantic principles and organized in mono-clausal sentences , use little morphology and avoid clauses subordination and passive constructions. The overt expression of some thematic roles, most often the agent, in questions and requests, is often omitted as it is inferred from the context. Thus, the intended message contains the linguistic forms only absolutely necessary for its successful interpretation as pragmatic and extralinguistic context are significant contributors, demonstrating that natural language cannot be context-free, as opposed to artificial languages.

In sum, some languages unaffected by written standards and used by millions of people as fully functional language systems, display the trademarks of spontaneous dialogues in languages with long literary traditions, confirming the universality of such systems.

Given the systematicity and universality in the organization of spontaneous spoken dialogues, the label “ spoken grammars” is justified.

Importantly, modern linguistic paradigms define language in terms of written texts and identify the sentence as the basic unit. In this sense, given that in spoken dialogues utterances are rarely composed of complete sentences, these are understood as reduced and inherently deficient versions of written texts, ultimately unworthy of serious scientific consideration.

But if one considers a different angle and refers to the structure of spontaneous dialogues as “ spoken grammars” , where the word, phrase and sentence are autonomous units as in Construction grammar ( A. Goldberg 2003) the grammar of written texts should be regarded as derivative of spoken grammar where the lack of contextual support is viewed as a deficiency in need to be compensated for by the use of elaborate grammar to make the message

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sufficiently explicit. Most importantly, the knowledge of language of a fluent speaker must include mastery of the rules of conversation.

In this sense, if the intuition of the average native speaker regarding grammatical correctness is to be consulted, most speakers would prefer the less rigid terms 'adequate' vs. 'inadequate', or 'acceptable' vs. 'unacceptable'. In any case the judgements of the average speaker must be given more value than the judgements of linguistic professionals.

### 3. Modern civilization and visions of the Language Faculty

Language is one of the defining traits of the human species, comparable to the flight of birds and the swimming of fish. This means that the human organism must be innately prepared in some ways for the use of language. That said, complex behaviours in many species, although innately based, requires learning and, in the case of language, much more extensive learning. The presence of some form of bio-cognitive predispositions for learning and processing language in the human organism, labeled as Language Faculty is indisputable, although the specific meaning of this term is debatable and there is a diversity of views. Scholars of generative persuasion hypothesize the Language Faculty as an instinct-like innate syntax-forming algorithm, while functionalists argue for an emergent Language Faculty, assembled from a number of unrelated cognitive and physiological properties of the organism under the influence of experience with language during language attainment.

That said, although the Language faculty is defined as a bio-cognitive entity, it is understood in terms of written texts and programming languages, both products of human culture. In other words, the complex grammar demonstrated exclusively in the output of highly educated professionals is taken to have direct representation in the human organism as innate property of the human brain/mind. In the following segment I will challenge the validity of this approach and show that it is detrimental to future inquiries by confusing the products of evolution with the fruits of civilization and leading empirical inquiries in search for the Language Faculty in a wrong direction.

#### 3. 1.Linguistic algorithms and the human organism

The biolinguistic paradigm defines the Language Faculty as algorithm borrowing theoretical tools from Turing's theory of computation. In biolinguistic context the human brain is understood in terms of digital technology, borrowing terminology from computer science, e.g. the human brain is defined in terms of working memory, online processing, interfaces etc. and Bickerton refers to the cognitive resources for grammar as bioprogram. (Bickerton D.1984 and elsewhere).

And although advertised as simple by the Minimalist program the algorithm specifies in great detail the postulated features of the grammar of human language as follows:

\*It produces hierarchically organized structures.

\*All operations are cyclical.

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- \* All operations are local.
- \* Control operates on deficient clauses which contain elements in need of proper case assignment .
- \* Rules are structure-dependent .
- \* Movement is always local, upwards, structure-preserving and under C-command configuration.
- \* Case and agreement apply at Xo and XP, but not at X' level.
- \* Pronouns and reflexives are in complementary distribution and are subjected to binding principles.
- \* Grammatical structures must be semantically interpretable.
- \* The output of each cycle of linguistic computations are fed into two interfaces, the Logical form and the Phonological form, which produce meaningful and pronounceable pieces of usable language.

The Minimalist views on the Language faculty are outlined in detail in Chomsky 1995,2005, Hornstein 2018 and elsewhere.

In analogy with computer programs , i.e. artificially designed inward-looking systems designed to function in isolation from the surrounding environment, the language-relevant cognitive functions of the human brain are understood as isolated from the rest of cognition and as such independent from the rest of the human organism and its interaction with the external environment in terms of perception and general intelligence. In this respect Pinker writes:

“ As with other symbolic systems that encode logical information, such as arithmetic, logic and computer programming, it is essential to get the parentheses right, and that's what phrase structure in grammar does” ( Pinker, S.2003, p.18 )

On the other hand, the vision of the Language Faculty, informed by Cartesian philosophy and advocated by the generative approach is countered by John Searle ( 1980) who demonstrates in the Chinese Room argument that , unlike programming languages processed by man-made processing devises , natural language processing by a human brain cannot be meaning-independent. The criticism comes also from some fellow generative linguists. Similar objections to the digitalization of language processing in the brain is voiced by Jackendoff R. (2002).

“ ...the functional state-space in language is usually taken to be discrete or categorical. A phoneme is a b or a p, but not something in between, a syntactic category is an NP or an AP, but not something in between. By contrast, neural computation appears to be somewhat graded, a matter of degree of activation and synaptic strength.” (Jackendoff, R. 2002 p. 25).

To my knowledge to date the experimental literature has found no evidence that any aspect of the human brain can be attributed innate capacities comparable to man-made computing devices. In fact, discreteness, absolutes e.g. yes/no, 1/0 are concepts foreign to biology.

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### 3. 2. Bilingualistic visions of Language Faculty and writing

The conceptualization of language in terms of discrete elements is inherited from Saussurean linguistics conceived under the influence of writing and the Roman alphabet, another unnatural, i.e. artificial system. Subsequently, mentalistic paradigms have adopted this conceptualization of language as a property of the Language Faculty. The generative paradigm's bilingualistic vision of language is influenced by writing systems as technology, reflected in its vision of language in terms of strings of discrete spatially arranged characters with fixed relations to one another. The perception of the sound stream as a string of phonemes and the understanding of the phoneme as an abstract concept is influenced by experience with writing. In syntax the boundaries of the sentence are marked by capital letters and punctuation marks. Grammatical structures are represented by spatially organized tree-like structures. The spatial aspect embedded in the understanding of grammar is also reflected in linguistic terminology, e.g., embedded clauses are 'left' and 'right branching', and phrases have left and right headedness, a clear reflection of written text and its position on a page. For spoken language one would use 'preceding' and 'following' as sound travels in time not in space.

On the other hand, the ability of the human mind to process discrete and highly abstract linguistic commutations, said to be an innate and universal property of human cognition, is shown to be a product of experience with modern civilization under the influence of the individual's education.

“...we know that the brains of literate persons are substantially rewired compared to that of their illiterate siblings” (Levinson S., 2012, p. 397). Literate individuals are more inclined to form abstractions which reflects the influence of literacy on perception.

Port R. (2007) shows that literate individuals are more inclined to form abstractions and explains this fact with the influence of literacy on perception and the alphabet as a writing system, which is “... an engineered method for language representation – a culturally transmitted technology ...” (Port, R. *ibid.* p. 155, ).

In this sense the mental representation of a phoneme is taken to be an equivalent to a letter. “...the vividness of our intuitions about the segmental organization of speech is largely a consequence of training in reading and writing with an alphabet.” (Port, R. *ibid.* p. 153 ).

In addition Dabrowska E. (1997) has demonstrated that English speakers vary significantly in their language proficiency, correlated with their level of education. Highly educated speakers rely more on grammatical information in comprehension, as opposed to less educated ones who rely to a significant degree on semantics.

On the other hand, the average language speaker in a pre-literate society, lacking access to literacy and schooling, learns the local colloquial language variety after an extensive exposure to examples of real linguistic communication beginning before birth and continuing for several years afterwards. As a result of that every normal human achieves an average level of proficiency in both vocabulary and grammar, sufficient enough to understand and be understood in his/her daily functioning in a social circle of individuals who share a life style, world view and cultural values. A full mastery of grammatical detail in the linguistic output of

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highly educated westerners, brought up under the influence of writing, takes in addition at least another decade of extensive and focused training as a component of professional training. This includes the use of a large vocabulary and sophistication of grammatical detail as multiple embedding of phrases and sentences, normally used in official government documents, speeches, journal articles, plus skilful use of semantics in rhyme, metaphor and other figures of speech by professional poets, writers, playwrights etc.

Thus, bio-cognitive resources marshalled in service of mastering language as a professional tool through extensive education in service of highly complex civilization cannot be mistaken for natural endowment. Consequently, if we are to reach adequate understanding of language origins and evolution, attention must be focussed on hunter-gatherers as their societies and cultures are the most realistic window into human pre-history and the place of language in it. These provide a unique opportunity for direct access to language form and function in conditions most similar to those of the communities of the first language speakers. In addition, by comparing and contrasting the form and function of languages spoken in small isolated hunter-gathering communities and languages of advanced modern civilizations understanding would be gained on the role of civilization on the organization of language.

From a different but related perspective, the biolinguistic vision of mind based on writing as the fruit of modern civilization is inaccurate also from evolutionary stand point. Given that human speciation is dated at about 250,000 ya and given that the first writing systems are dated at about 6,000 ya, to claim that evolution has pre-emptively prepared the human mind for the future contradicts the fundamental principles of evolution, i.e. evolution has no foresight, it is not a leader, it produces a response, reaction to already existing environment.

### 3.3. Language acquisition in advanced civilization

The generative paradigm argues for a Language Faculty which equips from birth every human, with the inherent ability of the ideal speaker, unleashed almost instantaneously in early childhood. This innate potential is said to be turned on by minimal exposure to experience with language, regardless of education and training and even despite of it, thus, almost instantaneously becoming the incarnation of the ideal speaker. This is one of the foundational assumptions for innate grammatical rules, known as “the poverty of stimulus” hypothesis, suggesting that language is unlearnable. The term “language acquisition” implies the understanding of this process as biological growth, i.e. instinct-like, effortless, automatic and inevitable.

On the other hand, the statement of the impoverished and defective nature of linguistic communication as insufficient input to language attainment by youngsters has been treated as a proven fact and a factual foundation to the innatist argument. At the same time the concept of “poor” vs. “rich” stimulus has never been clearly defined, not to mention that the use of adjectives implying gradience is inconsistent with the generative conception of language in terms of computational discreteness and precision.

That said, the studies on language acquisition dominating the field are based on observations

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of children in highly civilized societies where this process happens under the influence of education and writing. Importantly, empirical studies by ( M.Tomasello 2000; D. Slobin 1982 ; G. Pulum, B. Scholz, 2002; G.Sampson, 2007 among others) demonstrate that the linguistic environment children in advanced societies grow up is replete with examples deemed by generativists to be unavailable. In short, the stimulus is quite rich and conducive to learning which explains why the learning of the local language is, indeed, inevitable. In addition, studies of infant development show that children's exposure to language begins prenatally (G. Dehaene-Lambertz, 2017) and lasts for several years afterwards. Babies hear even in their sleep. So, they experience plenty of exposure to linguistic communication, long before becoming participants. No other skill is as intensely practiced as language is .With so much training, it would be a miracle if they do not manage to learn the local language.

And although all normal children attain adequate level of proficiency in a language in a short period early in childhood, describing this process as fast and effortless is a misrepresentation. Chomsky and others have argued that children become fully competent speakers at a very early age, i.e.3-4 years of age. That said, although 4-year -olds are definitely competent communicators, it is not difficult to realize that the language proficiency of preschoolers is far from that of an adult. Pinker S.( 1994 ) argues that full language proficiency takes a lot longer, e.g. 12 years. Given that even today in many places the life expectancy of people is about 50 years, 12 years is a long time and can hardly be defined as short period.

To my knowledge there are no studies of language attainment in primitive societies which suggests that the study of language attainment is distorted by implicit bias from the start. This means that objective inquiries into language attainment has not even begun .

#### 4. The Language Faculty and linguistic behaviour

The generative paradigm from its inception is based on Chomsky's famous rejection of Skinner's extreme version of behaviourism and his vision of cognition as a “ blank slate ( Chomsky, N. 1959). Chomsky's criticism, though, leading to a complete rejection of the role of learning marks the other extreme in the misunderstanding of cognition and behaviour, stipulating the leading role of innate factors in cognition. It also lead to his denial of behaviour as indication of cognitive capacities. In this context linguistic behaviour was deemed as unreliable indication of the properties of the Language Faculty, conceived of as inward-looking system designed to function in isolation from the rest of cognition and the human organism and its interaction with the external environment in terms of perception and general intelligence.

On the other hand, it is a truism in life sciences that in all species biology and behaviour are closely interconnected and interdependent as in all species the purpose of innate traits is to guide behaviour and in this way facilitate survival. Moreover, the only way to detect biological and cognitive capacities is by monitoring and/or provoking, usually by performing tests, their use in behaviour. From the muscles to the nervous system to the brain cells, one can detect their function and therefore, their biological organization , which can serve as a starting point for hypothesizing their evolutionary *raison d'etre* and, by triggering a behavioural response. In

short, behaviour is the clearest indication of biological and cognitive potential in any biological form. The same general principle applies to the role of human behaviour in understanding of aspects of the human organism. There is no reason why the same general principles should not be applied for estimating the properties of the language faculty from its use in linguistic behaviour.

#### 4.1. The Language Faculty and the pre-literate speaker

The defining characteristic of science as a reliable source of knowledge is its reliance on facts. But the observable reality is messy and sanitizing the raw facts, that is, their partial alteration in order to make them amenable to scientific testing in artificial conditions is a standard methodological procedure in all fields of study. For example, in chemistry experiments are performed with purified elements which is unnatural condition for chemical elements as in nature they are found in compounds with other elements. In biology experiments are performed in artificial environments in labs and/or zoos.

Nevertheless, during this process of purification the defining properties of the object of study are preserved in order for the experiments to produce relevant and reliable conclusions. The individual objects of study must be typical representatives of a class/group etc., not exceptions. A typical example of a species is a normal adult specimen, not an anomaly. A representational example of a human liver is the liver of a normal adult human, not the liver of an athlete. That is, one does not take an exception as a representation of the norm. An exception cannot become a type and the factual foundation for generalizations. In all fields of study the theoretical machinery reflects the most fundamental properties which define the object of study and distinguish it from others. Importantly, a typical example is an empirically detectable existing entity, not a model or drawing of it. It is true that there is a human skeleton made of plastic in a physician's office and medical students study human anatomy first from digital images, essentially the equivalent of the ideal speaker. That said, these are applicable only for educational purposes and experiments and tests, eg. testing of new medications and treatments are performed on real biological forms, not models.

By this line of reasoning it is logical to anticipate that the linguistic output of the average adult normal human, as the typical representative of the human species, would be the most relevant source of data for a theory of language.

In this sense Chomsky's views of language which focus on the intuitions of an idealized language user as a factual foundation for the generative/biolinguistic paradigm, are inconsistent with the fundamental requirements of science, making it immune from experimental verification.

The spontaneous linguistic interactions of illiterate speakers differ fundamentally from the meticulously structured linguistic output of highly educated intellectuals, which furnish the factual foundations of modern linguistic theorizing. Having in mind that the bulk of linguistic communication both in space and in time is conducted in spoken dialogues without exposure to modern civilization and writing, it is this type of communication that must be referred to as natural language. That is, the spontaneous linguistic interactions of average

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illiterate humans using language while going about their daily lives, and not the preplanned exposition of complex ideas in linguistic forms used as professional tool by intellectuals with extensive language training, must be identified as natural language.

Given that behaviour is the best indication of cognitive abilities, the spontaneous linguistic behaviour of the average adult human is the best indication of the Language Faculty.

Indeed, experimental data reveals that the brain of the normal adult average language user differs significantly from the hypothetical brain of the ideal speaker in its processing of language. R. Port (2007) has shown that words are stored in memory as rich descriptions of individual examples of use, where linguistic properties are combined with extralinguistic details. The vocal representation of a word in memory is articulation-based, not abstract features-based. That is, in real normal human brains words are stored in the form of specific events with idiosyncratic details, not as structured combinations of discrete abstract categories. Moreover, the processing of language is not different from the way any other perceptual experiences (visual, tactile, etc.) are processed.

In short, language is stored in memory in terms of detailed description of individual perceptual experiences which include non-linguistic contextual details. This process is subconscious and universal. And given that for the most part of human history the normal human adult has been a speaker of languages designed for the communicative needs of pre-literate communities, one should extrapolate that the brain of the normal human illiterate adult would reflect most accurately the human Language Faculty. It should potentially include at least speech capacities, innate predispositions for formation of lexical items as outlined by Bloom P. (2000), innate facilitation for the formation of basic grammatical categories, e.g. animate vs. inanimate, capacities for mind reading and participation in dialogue by following the Gricean maxims of communicative cooperation.

#### 4. 2. The Language Faculty as innate predispositions for the basics of lexicon and grammar

Formal theories define language as syntactic structure. That said, structure by itself does not constitute language. Corpus-based studies reveal that language is an integrated system, a continuum of lexical words and highly abstract structures. For example, as per Givón T. (1979, p. 14) the lexical categories verb, adjective and noun are not discrete but form a continuum based on their semantic representation of time-stability of a property or state. At one extreme of the continuum are active verbs which normally denote rapid change in a state, e.g. jump, start, begin, etc. States of short duration are lexicalized as verbs, adjectives or nouns, ex. young (adjective) / youth (noun), while permanent states are lexicalized as nouns, for example, man, woman, sky, tree, etc. and they form the opposite extreme of the continuum. Moreover, the distinction of regular and irregular verbs is a matter of degree. The gradient nature of language is also pointed out by Greenberg who understands universals as organized in clines (J. Greenberg, 1961). Lexical items can change their position on the cline by undergoing a process of grammaticalization (see Hopper P., Traugott, E.C. 1993).

In addition, language processing in normal adult brains displays a clear pattern of close association of lexical words, phrasal and sentential frames in both production and comprehension, suggesting that the processing of both aspects of language, lexical words and

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abstract patterns, are subjected to the same computational procedures and handled by the same brain mechanisms ( Bates E. Goodman J. 1997). They also show interdependence between progress in attainment of lexicon and grammar during early language acquisition. Similar patterns of continuity of lexicon and grammar are suggested by studies of language disorders. More recent studies in psycholinguistics confirm that both lexical words and grammatical structures are processed, stored and retrieved in conjunction by the same regions of the brain ( Kaan, E. 2009 ). Similar assertions are made by Lenneberg as early as 1967. Further, empirical studies of language processing by PET scan and MRI have found difficulties in isolating purely syntactic processing from semantics and context influences as these are always intertwined.

Moreover, the inability of trained apes to master grammar are explained by Bates E. and Goodman J.( 1997 p. 19) with their limitations in vocabulary learning, another suggestion of the interdependence of lexicon and grammar, meaning and structure in language. In sum, language as a human behaviour necessarily implies the continuity of lexical and grammatical elements and the bio-cognitive representations of this behaviour clearly reflects this fact.

## 5. The Language Faculty, evolutionary perspective

From an evolutionary perspective the concept of protolanguage as a grammarless system ( Bickerton D. 1984 and elsewhere) suggesting that lexicon and grammar mark different stages of language evolution and of the phylogenesis of the human Language Faculty, is contradicted by the studies referenced above.

A successful understanding of origins and evolution of language must take into account the following considerations:

a. Given our current knowledge of lifestyle and culture of the first human communities we can assume with confidence that they lived in small communities of genetically related individuals, i.e. extended families, organized in culturally and informationally homogeneous, egalitarian societies, implying that a significant portion of knowledge is shared by all members. This means that there is not much new information to share, suggesting lack of demands for elaborate language system. In these circumstances smaller vocabulary and simple grammar suffices.

b. There are notable similarities between the modern hunter-gatherers and the first human societies in social organization and communicative needs dictating the organization of language. This suggests that, given that similar communicative demands of ancient and modern hunter-gatherers require similar means of communication, one can make inferences, although with caution, about earlier stages in language evolution from modern examples of language use. So, dialogues composed of short messages, which require little cognitive expense to process and little physiological effort to pronounce, were enough to answer the needs for exchange of information most essential for survival. It is this type of communication which was adaptive for living in pre-civilization habitats. In comparison, languages with long literary traditions which carry the better part of the extended

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communicative demands of a large diverse society marked by information inequality, necessitates a large vocabulary of constructions which imposes high processing demands and extra efforts for articulatory precision.

That said, hunter-gatherers as well as western college graduates are born with the same language-relevant innate predispositions, a Language Faculty, limited to the essentials of language, as it has evolved in pre-civilization environments.

## SUMMARY AND CONCLUSIONS

Ever since Chomsky argued for an innate Language Faculty as explanation for the human ability to attain and process the complex linguistic systems of modern languages defining and finding such capacity has been the ultimate goal of linguistics. That said, after multiple decades of dedicated intellectual power in multiple fields of inquiry, although much has been learned of the language-relevant aspects of the human organism, crucial details of the language capacity remain unclear. One can suspect that the lack of progress is explicable in part by misdirection of the search. I have argued that this regrettable state of affairs is explicable by the fact that the very concept of the Language Faculty as a bio-cognitive entity is ill-conceived as it is strongly biased by the influence of modern western thought resulting in confusing the results of evolution with the fruits of modern western civilization.

And although some degree of bias is inevitable in any human endeavour, in scientific inquiry one must aim to minimize it. To achieve that in the field of linguistics it is prudent that natural language exemplified by the linguistic output of the normal illiterate adult human be regarded as the most clear representation of language as a uniquely human behaviour and the most reliable indicator of the content of the Language Faculty in the individual mind. A clear understanding of the Language Faculty will also provide a reliable starting point for tracing its evolutionary path.

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