REEVALUATING PROTOLANGUAGE AND ITS PLACE IN EVOLUTIONARY LINGUISTICS

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Abstract

The concept of protolanguage, introduced by D. Bickerton as a label for the initial stage in a two-stage hypothesis of language evolution, from lexical protolanguage to modern language, has been instrumental in defining the bio-cognitive foundations of language in biolinguistic context . It continues to be highly influential in evolutionary linguistics despite its highly speculative nature rooted in empirical inaccuracies and outdated theoretical convictions. Given that various recent empirical findings contradict some of the fundamental assumptions underlying the concept, its reconsideration and reevaluation is warranted without dismissing its contribution to the field.

Key words: language evolution, protolanguage, language bioprogram hypothesis, Universal Grammar, biolinguistics,

Introduction : The concept of protolanguage in evolutionary research

The concept of "protolanguage" was introduced by Bickerton (1984,1990)to refer to a hypothetical pre-human communication system preceding the emergence of modern language. It is envisioned as a well defined , stable communication system , a temporary , although lengthy , stage in the transformation from animal communication to modern human language. It was intended to help explain language in evolutionary terms by suggesting that the gap between non-human non-linguistic species and sapient species as language users was bridged by an intermediate stage , more advanced than animal communication but less complex than modern language. Most students of language evolution agree that modern grammatical complexity was preceded by much simpler communication systems and have adopted the term "protolanguage" to label it .

Various alternative visions of protolanguage are proposed with various degrees of epistemic influence. Bickerton's hypothesis of lexical protolanguage has so far been the most influential. It refers to a specific type of a primitive communication system (Bickerton 1990, 2003, 2014) defined as semantically organized around predication and centred on the proposition, but structurally inefficient, ambiguity-ridden and context-dependent. It is characterized as "lexicon without syntax " .

Lexical protolanguage is characterized as : 1.a small vocabulary of proto-words, i.e. lexical words in their basic , morphologically simple form 2. with concrete meanings, organized in categories of object words (nouns) and action words (verbs). 3. extensive use of compounding 4.extensive use of serial verb constructions instead of sentence embedding . 5. hierarchical structure based on semantic relations, 6. absence of abstract grammatical categories of subject, direct and indirect object, case, tense, aspect, complementizer, characteristic of grammars of modern languages, 7. no signs of grammaticalization process, 8. no fixed phrase structure and phrase embedding , 9. one-place predicates, 10. extensive use of stress and intonation as a replacement of grammatical devices, e.g. negation and questions, 11.

proto-words combine to form proto -propositions usually referring to current events, (reference to here and now) .

Some modern forms of linguistic communication, highly restricted in spheres of use and rudimentary in internal organization are said to exhibit similarity to the hypothetical lexical protolanguage : 1.the communication of small children during the initial stages of language learning /acquisition, who learn language under normal circumstances. 2. the communication of feral children , 3. the early stages of newly emerged sign languages and homesigns , 4. pidgins, creoles and Basic Variety, 5 .the linguistic communication of agramatic aphasics. 6. The linguistic achievements of trained apes.

The following examples are illustrations of protolanguage.
* pidgin : A. What say? Me no understand. (Bickerton ,D. Language and Species, 1990, p. 121)
* Genie: Applesauce buy store. (Bickerton,D. ibid. p. 116)
* child: Walk street. Go store. (Bickerton, D. ibid. p. 114)
* Basic Variety: Steel girl bread.(Bickerton ibid.)
* Nicaraguan Sign Language: MAN CRY
* agrammatic aphasics: She speak. (O'Conner, B. et all.2005)
* primate sign communication: GIVE ORANGE

These are considered to be a window into the otherwise empirically inaccessible evolutionary history of language and interpreted as evidence for a lexical protolanguage as a distinct intermediate stage in language evolution.

An alternative vision of protolanguage is proposed by Alison Wray, (2002, p. 113 -) who entertains the idea of a hypothetical holistic protolanguage composed of a restricted number of formulaic expressions where strings of discrete sounds, (suggesting a phonological system) , are mapped onto to an entire proposition (suggesting holistic meaning) as a predecessors of proto-words. The holistic messages are attributed to Erectus and are said to have functioned as efficient and unambiguous expressions of the community's emotional life as formulas of social bonding.
Some students of the field (M.Corballis, 2003, M.Tomasello, 2008) have argued for gestural protolanguage as a predecessor of spoken language i.e., that language originated in manual gestures. The hypothesis for a gestural protolanguage has gained credibility in evolutionary linguistics given that modern apes have demonstrated some success in mastering gestural protolanguage, which provides a nice continuity explanation for language origins . A counter argument argues for vocalizations first . i.e. that linguistic communication has been vocal since the beginning and evolved from primate vocalizations is advanced by P. Liebermann, (2007 and elsewhere) who has consistently argued that the human body has physiological, anatomical and neurological adaptations for the articulation of speech.
Bickerton's hypothesis of " lexical protolanguage " as a distinct and well defined stage of language evolution has had a major influence in evolutionary linguistics. It is attributed to Erectus of which Neanderthals and possibly other ancestral species are descendants.
The postulation of a protolanguage advances a particular version of language evolution as a

sequence of a Darwinian process resulting in a capacity for protolanguage followed by a one-time event with crucial consequences, a mutation in an African female erectus, with sudden and transforming result. It marks a speciation event initiating the formation of human species as highly unusual life forms with unprecedented cognitive abilities explicable with the appearance of a structure-forming cognitive algorithm or UG. (Bickerton, 1984). The connection of these two cognitive capacities ,the capacity for lexical protolanguage and the newly formed structure-forming cognitive entity or UG, Bickerton argues, resulted in mapping of the structureless protolanguage onto the highly specific structure of UG ,making possible the syntactic complexity of modern language. In this way the proposition structure , hierarchically organized around predication and characteristic of protolanguage, is mapped onto an abstract grammatical structure, hierarchically organized around a head , complements and a specifier, the result of which is a grammatical sentence of modern language . In this way the hypothesized mutation is said to have transformed the erectus protolanguage speakers of which Neanderthals and possibly other ancestral species are descendants, into Homo Sapient language speakers .

Bickerton views both protolanguage and language as primarily representation systems, although each reflecting different facets of the human cognitive capacities for conceptualization , the first, connected, although indirectly, to experience and the second, independent of it and emergent from brain-internal self-organization .

The Bickertonian concept of protolanguage and the argument for a protolanguage stage in language evolution is premised on the following assumptions: 1. dichotomy of lexicon and grammar, 2. the modular nature of the human brain and language processing 3. takes as a given the “uniformitarian hypothesis ” 4. defines the evolution of language as accidental appearance of grammar module by a genetic mutation . 5. underscores the exceptionality of human species in both our cognitive and communicative capacities and our discontinuity from the rest of life forms.

The present paper argues that in the years and decades since the argument was conceived a growing number of empirical studies in multiple fields have resulted in better understanding of natural language, the language capacity, the human brain , human evolution . This has provided firm grounds for questioning the underlying assumptions behind the argument for a protolanguage stage in language evolution suggesting that the very concept of protolanguage and its place in evolutionary linguistics must be reevaluated.

The argumentation skeleton of the article is as follows: first I offer a brief summary of the relevant empirical findings which contradict the foundational assumptions of the argument. Further I present an alternative interpretation of the concept of protolanguage and its place in evolutionary linguistics.

1. Language as integrated system

Bickerton's argument for a protolanguage assumes the generative formalism which defines language in terms of dichotomies of lexicon and grammar, meaning and form, form and function and defines grammar as meaning-free and function-free abstract structure.

It reflects both the deficiencies and strengths of the generative paradigm as a strictly formal,

fact-free enterprise .

1.1. Language: continuity of lexicon and grammar

Defining language as a dichotomy of lexicon and grammar is one of the hallmarks of the generative formalism , based on the premiss of "...clear division of labour between functional and lexical items " as they argue that there is a definitive difference between the information encoded in a lexical verb, i.e., the type of an action, state, and that encoded in its grammatical markers. i.e. to locate this action in time by tense markers , to specify its manner by aspect markers, etc.(M.Tallermann et all., 2009, p.138).
That said, corpus-based studies reveal that the language system itself provides evidence to the contrary, i.e. for the inseparability of lexicon and grammar. B. Comrie and T. Kuteva (2005) , have demonstrated that concepts usually encoded in grammatical forms in modern languages almost always can alternatively be expressed in lexical words , pointing at synonymy between lexical and grammatical forms.

Corpus-based linguistic analysis , in addition, reveal continuity in the semantics of linguistic items around the continuum from content nouns to forms with increasingly more abstract meanings, i.e. prepositions, tense/aspect/mode markers, definite/indefinite articles, etc. Thus, language is organized along a continuum of meanings. Moreover, forms of some level of abstraction , e.g. prepositions, depend for their existence on content words, tense/modality/aspect morphology are conditioned upon the existence of lexical verbs suggesting the internal integration of the system as a whole.
Even some prominent generativists , e.g.R. Jackendoff and collaborators state that there is no dividing line between protolanguage and language as modern language contains forms of the putative lexical protolanguage (P.Cullicover, R. Jackendoff, 2005; R. Jackendoff, E. Wittenberg, 2014). Thus, facts on the ground clearly contradict the formalist assumptions of discrete boundaries between lexicon and grammar and show that language is an integrated system where the elements exist and function as part of a continuum.

1.2 . Continuity of lexicon and grammar, evidence from psycholinguistics

Bickerton's argument for a " lexical protolanguage" is premised on the generative assumption of dissociation of grammar and lexicon in early language attainment in normal children as some scholars , referring to superficial observation, define language development as a two-stage process of a well defined initial stage of vocabulary learning as a stepping stone to a subsequent stage of implementing of syntax and morphosyntax. Nevertheless, with detailed analysis of wide range of facts E. Bates and J.Goodman, (1997) have empirically demonstrated that during language attainment in normal children the earliest vocabulary items learned include content words and function words, e.g., articles, prepositions, conjunctions , pronouns, etc. and high frequency verbs are learned fully inflected, including their irregular forms. In addition, the authors show that there is a demonstrable link between progress in attainment of both lexicon and grammar. Empirical evidence has shown that early child language does not display the expected universal features of telegraphic speech or protolanguage, but rather

reflects the idiosyncrasies of the language acquired (D. Slobin , 2002, 2004). Evidence has also shown that early child language is " item-based", a limited number of high frequency holistic constructions detected in adult speech are memorized and only subsequently and gradually become segmented into combinable units (M. Tomasello, 2002). In sum, lexical words and grammatical markers are learned in tandem, suggesting that language is learned as a continuum of lexical and grammatical forms, discrete and holistic elements.

In addition, language processing in normal adult brains is found to display 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 abstract patterns, is subjected to the same computational procedures and handled by the same brain mechanisms. (Bates, Goodman 1997). Moreover, the inability of trained apes to master grammar are explained with their limitations in vocabulary learning (1997, p. 19). On the other hand, an ability to learn even a small lexicon suggests a possibility for some potential for language attainment expanding beyond species boundaries.

Similar patterns of continuity of lexicon and grammar are suggested by studies of language disorders. Traditionally the most consequential language disorders are impairment of Broca's area resulting of agrammatism or inability of individuals to process syntax ,while impairment in Wernicke's area is associated with difficulties related to the lexicon , demonstrated by difficulties in comprehension, word finding, i.e. anomia, etc.
That said, language processing in normal adult brains is found to display 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 abstract patterns, is subjected to the same computational procedures and handled by the same brain mechanisms. Bates and Goodman (1997) also observe " parallels between lexical and grammatical deficits" (ibid.p. 21) prompting the authors to suggest a " lexical/grammatical co-impairment" (ibid.p.21). The same pattern of difficulties in word finding parallel difficulties in grammar , suggesting association between the two disorders , is noticed in Alzheimer's patients. Bates and Goodman's findings are confirmed by the latest findings in psycholinguistics that both lexical words and grammatical structures are processed, stored and retrieved in conjunction by the same regions of the brain (E. Kaan, 2009).
Thus, multiple lines of evidence corroborates the pattern detected by Bates and Goodman (ibid) that the lexicon and grammar at any stage of language use are handled together by all brains, growing and fully developed, healthy and impaired.

2 .Language processing by the human brain, modularity or continuity

The theoretical partition of language in lexicon and grammar is based in part on the mentalistic perspective on language and the argument for spatial and functional segregation of lexicon and grammar in the brain (N.Chomsky 1972; S.Pinker 1994, D. Bickerton, 2014 among other like-minded linguists). It has been challenged by a number of empirical findings, some more recent than others.

2.1. On the continuity of linguistic computations , evidence from brain studies

Recent studies report a challenge to pinpoint the localization of language in the brain given that a large portion of the brain is involved in language-relevant functions, including subcortical regions such as striatum, cerebellum, thalamus, among various others (S. Fisher, G. Marcus, 2006). Further, empirical studies of language processing by PET scan and MRI have found difficulties in isolating purely syntactic processing from semantic and context influences as these are always intertwined. In addition, purely syntactic computations involving long distance dependencies are not concentrated in any one location but involve coordination of a network of neurons located in various parts of the brain. E. Kaan (2009) found that the brain does not differentiate between pronouns and reflexives. The distributed nature of language -relevant functions in the brain is also illustrated by studies of language deficits which demonstrate that Specific Language Impairment (SLI) "...can be traced back to impairment of a system that is implicated in functions other than language".(Bishop 2009, p. 192). These are consistent with earlier findings by E. Lenneberg who as early as 1967 states the the brain is an integrated whole and it evolves as a whole.

"...In the brain...there are no independent parts or autonomous accessories...the entire brain is a functionally integrated system with constant, spontaneous and inherent activities that involve all healthy structures. ...we cannot expect to find any kind of new protuberance or morphological innovation which deals exclusively with a particular behaviour. Any modification of the brain is a modification of the entire brain. Thus, species-specific behaviour never has a confined , unique neuro- anatomic correlate, , but always and necessarily must involve reorganization of processes that affect most of the central nervous system." (E.Lenneberg, 1967, p. 54-55).

Moreover, he states that the theoretical partition of the human brain into separate areas for lexicon storage and rules of computation is not supported by evidence .

" The narrow localization theory which holds that engrams for words or syntactic rules are stored in certain aggregates of cells cannot be in accord with the clinical facts" (E.Lenneberg, ibid. p. 60)

Thus, the segregationist account , i.e. the argument for spatial and functional concentration of language-relevant functions is found to contradict the logic of the internal organization of the human brain.

That said, although language-relevant functions of the brain are widely distributed (B.Gulyas, 2009, p. 59; Ph. Liebermann, 2000), it has been confirmed that linguistic functions in most normal individuals are asymmetrically concentrated in the left hemisphere. (Fedor, A. et all, 2009).

2.2.Broca's region as a multifunctional processor

Broca's region has long been regarded as the grammar organ, thus, assuming a modular perspective of human mind (J. Fodor, 1983). In this context Broca's (frontal cortex) and Wernicke's (temporal cortex) regions in the left hemisphere are traditionally associated with processing of language. The division of labour between the two was understood as production

vs. comprehension or syntax (in Broca's) vs. meaning and lexicon (in Wernicke's). The genesis of language in this context is understood as the imposition of hierarchical structure on pre-existing lexical protolanguage, envisioned to be a result of a crucial evolutionary event in human speciation resulting in the formation of Broca's region as the grammar organ and the defining feature of the cognitive and communicative exceptionality of human species and our discontinuity from the rest of life forms (I.Davidson,W. Noble, 1996).

That said, recent inquiries of the brain have altered our understanding of Broca's region disputing the segregationist account as it was found to be a complex and functionally diverse cognitive entity. Hagoort (2009) introduces the term " Broca's complex" and demonstrates that it fulfils a broad spectrum of cognitive functions of integrating various types of information retrieved from memory and provides internal organization in music, language, praxis, etc. ergo, deficits and/or damages affecting this part of the brain would impair a broad range of functions. Thus, Broca's complex is multifunctional. It participates in language processing by integrating phonological, semantic , grammatical , extralinguistic information in the formation of individual words and their further integration into larger structures, phrases and sentences. It processes information by continuously integrating new information as it is made available in sequence. This means that it builds a sentence incrementally from bottom-up and adds structural complexity as new lexical and grammatical information becomes available. For example, in lexical words with complex morphology the semantic component in the stem becomes accessible before the syntactic category as grammatical morphemes are usually sequentially positioned towards the end of the word. This contradicts Chomsky's argument for primacy of syntactic template which predicts that the grammatical information would be available a priori. Moreover, the " mirror neurons" , the link between cognition and communication, are located in Broca's. Thus, Broca's complex (Brodmann's areas 44 and 45) is found to be functionally diverse and neurologically heterogeneous.

To note, after some 800 studies devoted to mirror neurons are published since their discovery by Rizzolatti Arbib (1998) , their function in human cognition in general and in language processing remains unclear. For a review see Kilner, Lemon(2013)

In sum, given these findings, the generative account of spatial and functional segregation of grammar and lexicon and their independent evolutionary histories is no longer sustainable.

3. Protolanguage, language and language diversity

Uniformitarian assumptions of language are inherent to generative/biolinguistic paradigm and its Cartesian approach to language as a mental property (Chomsky, 1966,1986, 1995 and elsewhere). It follows from the generative argument for uniformity of the innate Language capacity and implies that all languages, real and potential, are produced by the language faculty uniform in all humans and, thus are of equal complexity.
Uniformity in language systems is also assumed by the usage-based /functionalist approach which, predictably, interprets the uniformitarian hypothesis from its own viewpoint: languages

are equally complex based on the assumption of uniformity of their functions. This means that despite the apparent differences , e.g. some languages have more complex phonology , others, more complex syntax, given that languages are integrated wholes, the differences in individual components balance each other and languages are of overall equal or very similar complexity. Moreover, it is argued that uniform complexity is maintained despite language change as, while one component of the language system may increase in complexity, another must become simpler, so that the language system as a whole maintains equilibrium in complexity. In addition, B.Heine, T.Kuteva (2007) argue for uniformity of process in glossogenesis opening the possibility to infer earlier stages of language by reverse engineering.
In sum, the standard view, shared by both dominant perspectives is that all extant and theoretically possible languages at all stages of their history are essentially of equal complexity and there are no simple languages.

3 .1.The equal complexity argument , language diversity and protolanguage

The thesis of equal complexity has been challenged and lately various scholars have presented convincing evidence against it. Some languages, although fully functional, show extreme simplicity in all aspects of the language system. David Gil, (2009) argues that Riau Indonesian " 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-Monocategorial-Associoational. Riau Indonesian has a few affixes, it also displays compounding, reduplication, a few words with grammatical functions. Given these limited grammatical resources Riau Indonesian is fully capable of handling all communicative functions other languages achieve with complex grammar. As the author states, " In principle, anything that can be said in such languages (with complex grammars clarification added) can be paraphrased within the confines of pure IMA language...In a nutshell, IMA language is enough to run a country of some two hundred million people, and by extension, most contemporary human activity throughout the world. " (ibid. p. 9 -10).
D.Everett (2005) reports on Piraha, which displays utter simplicity in meaning and structure, e.g. simplest pronoun system, the simplest kinship terms. Importantly, Piraha even fails to display the characteristics thought to be the very hallmarks of the human language, recursion as it lacks NP and S embedding, does not have linguistic means for talking about the past and the future: no verbs of mental processes e.g. think, believe, hope, which in European languages invite clause subordination.(I think, imagine , that ...) and the so called " counterfactuals ", e.g. hope, believe, etc. although has some morphology. Piraha communication is restricted to the factual present. It is one of multiple examples known to science which shows that complex thought can be verbalized with minimum linguistic complexity without limiting its functionality.
Cysouw and Comrie (2013) outline some structural typological similarities among a number of languages spoken by small hunter-gatherer communities in Australia with extremely simplified internal organization 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 reliance on contextual clues for the disambiguation of the message.
Thus, not only there is variation in complexity among languages, but there exist fully functional languages which, by the standards established by modern linguistics, barely qualify as languages and closely resemble Bickerton's lexical protolanguage.
Moreover, the assumption that language evolution has been in the direction of ascending complexity is challenged by the discoveries of languages like Riau and Piraha.

4. The concept of protolanguage in evolutionary linguistics

4 .1. Protolanguage, genes and the theory of evolution

To begin with, the understanding of language evolution which prompted the postulation of the concept of protolanguage is based on the classical model of evolution in terms of Mendelian genetics. It defines evolution in terms of gene recombination and language evolution explicable in genetic terms. Recent empirical discoveries have altered significantly our understanding of evolution and human evolution and revealed a much more complex picture of interaction of genetic, epigenetic, developmental and behavioural contributions to the process of speciation. Evolution was shown to be a multidimensional process (E.Jablonka,M. Lamb 2006). Moreover, it has been determined that human speciation is highly influenced by gene-culture co-evolution and language is one notable result of this process (S. Pinker,P. Bloom, 1990; V.Levinson, D. Dediu 2013, Stromswold, K.2010).

This new and improved understanding of human evolution over the classical gene-centred model invites rethinking of the current understanding of the phylogeny of language.

4. 2. Protolanguage, pidgins and creoles

Bickerton's vision of human speciation, language evolution and the concept of protolanguage stems from his studies of pidgins and creoles. The bioprogram hypothesis is premised on his analysis of Hawaiian creole and makes series of far-reaching claims , logically consistent with highly influential and well-established views which explains the prominence of his argument in evolutionary linguistics.
These are :
1.all pidgins display uniform properties irrespective of their source languages, 2. all pidgins are lexicon-based, thus, they are grammarless systems, 3. pidgins are a window into an earlier stage in the evolution of language, a modern illustration of protolanguage, 4. they reveal the cognitive and communicative abilities of pre-linguistic communicators , 5. capacities for pidgin communication are attributed to erectus, while capacities for grammar are viewed as banners of humanity, 6. creoles develop from pidgins and this development is inevitable ,7. the

development of creoles from pidgins is a demonstration of the language capacity which makes the formation of grammar inevitable, 8. young pidgin speakers play a pivotal role in the formation of creoles from pidgins .
That said, some recent discoveries and novel interpretation of some previously known facts, reveal inconsistencies in Bickerton's claims regarding language evolution, pidgins, creoles, child language attainment, among others, which puts into question the prominence of the concept of protolanguage in evolutionary linguistics. For example, creolists offer alternative understanding of pidgins/creoles. As per M. DeGraff (2001) pidgins are not grammarless systems. In Haitian creole almost all morphology is inherited from French and no stage of lexicon-only is documented at any point of its history.

" Indeed there is no documented stage in Haitian Creole diachrony where the language was affixless or with most affixes derived from " erstwhile free morphemes" (De Graph ibid. p. 240).

He argues that pidgins based on lexifiers with poor morphology, e.g., English, may indeed have started by borrowing bare stems, although this is by no means a universal phenomenon. There is also an alternative interpretation of the relevance of pidgin/creoles for evolutionary linguistics , i.e. that pidgins , while remaining languages , mark the lowest boundary of language complexity. They " preserve the components of linguistic architecture that are most robust and perhaps most deeply intrenched" (S. Mufwene , 2007, p. 36).
Mufwene (2007) argues that creoles do not evolve from pidgins as each type of language systems is formed as a response to very different historical circumstances and as such each has a different function. He argues that pidgins are formed in socio-economic circumstances of trade relations among ethnic groups who speak mutually unintelligible languages. They are formed in response to situations of sporadic language contact and have the limited function of a lingua franca. Pidgin speakers are native speakers of modern languages and their role is that of restructuring and simplifying modern languages for the purposes of linguistic interactions limited in duration and scope. Creoles, on the other hand, emerge in colonies where settled life and emergence of stable communities leads to expansion of linguistic functions which, as a consequence drives demand for increasing language complexity. Creoles in this context are viewed as just another example of diachronic change, although in unusual circumstances. Creole speakers in colonial societies are in the position of adult second language learners who also have to adapt the learned non- standard European vernaculars spoken by slave owners to ever increasing communicative demands of a new society. None of these situations resemble stages in language evolution (Mufwene S. 2007; DeGraff M , 2001). As per Mufwene plantation pidgins and creoles "present nothing that comes close to replicating the evolutionary conditions that lead to the emergence of modern language. Nor are there any conceivable parallels between, on the one hand, early hominid brains and the minds that produced the protolanguages". (Mufwene S. 2007, p. 2).
Not without problems is Bickerton's argument on the role of children of slaves as creators of creole grammars. The youngsters, whose parents were pidgin speakers, the argument goes, after experiencing an extreme case of " poverty of stimulus " being deprived from even a brief exposure to a modern language, invent a creole under the inevitable influence of the innate

Language Faculty, i.e. Bickerton 's analysis of pidgins and creoles leads him to confirmation of innate capacity for grammar.

That said, his analysis reveals limitations in our understanding of the history of colonization, slavery and the social and linguistic interactions created by these processes which explains that knowledge resulting from well-founded inferences grounded on established historical facts are substituted by assumptions and conjectures, some of which defy logic. First, the assumption that the African slaves in the plantations were native speakers of mutually unintelligible languages seems to me utterly unrealistic as , although it is likely that a slave owner have bought slaves from different tribes, they were likely from the same African region and spoke languages historically related and typologically similar and so, mutually intelligible to a degree sufficient to allow a broad range of conversation topics. Speakers of Romance languages Spanish, Italian, Portuguese, French, Romanian can cobble a conversation without translation given the similarities in the structures and vocabularies of their native languages explicable by their common origin, Latin. There is no reason to expect that the situation of slaves would be any different.

In this context linguistic communication would have included a larger vocabulary of content words and grammatical forms, far beyond the utter simplicity of a pidgin. As a corollary, one cannot maintain the argument of extreme poverty of stimulus in language attainment.

In addition, it seems natural that in a cotton field Africans from the same tribe would gravitate to their fellow tribesmen and continue speaking their native languages and maintain some of their cultural traditions. It is also natural to expect that slave African women would have spoken to their children in their native languages. Adult Africans were speaking modern African languages and slave owners were speaking modern European languages, the former attempting to learn the basics of the owner's language as a second language. So, young language learners were exposed to two modern languages which makes the assumption of extreme poverty of communicative stimulus highly exaggerated. Their situation would have been similar to that of children whose two parents speak different languages. The situation of slaves as second language learners is irrelevant to the study of language evolution.

And although my assumptions here might be conceived as speculative, given the lack of historical records as factual foundation for understanding in sufficient detail the linguistic context of pidgin formation in the era of colonization, one is forced to refer to universal patterns of human linguistic behaviours , inferring that these are repeated across space, time and irrespective of cultural idiosyncrasies.

In addition, in Bickerton's argument slave children play pivotal role as creole creators. That said, although toddlers do innovate , their linguistic inventions are not adopted by the population at large and quickly fade away. Young children introduce more regularity while young adults are the innovators . Young adults, on the other hand, are the initiators of social changes, revolutions, demonstrations. This explains their influence in language change as part of social change (D.Slobin 2004, p. 11) . As an example, the formation of Tok Pisin creole from Melanesian Pidgin is a direct consequence of the fact that Tok Pisin was attributed the status of the official language of the state of Papua New Guinea, i.e. the language in which

government documents, laws, institutions, business , education etc. are conducted. Toddlers have no role in state affairs.

In addition, the assumption that the evolution of grammar and the transformation of pidgins into creoles is an inevitable trajectory in the evolution of language, explicable by biological factors, is contradicted by the existence of Piraha, Riau and other languages which display strong resemblance to pidgins by minimal use of grammatical devices despite being fully functional languages.

In sum, pidgins and creoles are not modern illustrations of language evolution but language systems born by circumstances of modern civilization , i.e. trade and colonization. The modern social and economic circumstances which created them are in no way similar to the circumstance in which Erectus and even Neanderthals lived and functioned. Pidgins are produced by human beings with modern bodies and minds, after thousands of years of divergent sapient evolution.

Nevertheless, pidgin and creole speakers are pertinent to the study of language evolution as they demonstrate that speakers adapt their language systems to their communicative needs. Reduced needs are addressed by simplification and extended needs are addressees by complexification, thus, pidgins and creoles have separate histories and result from different socio-cultural circumstances. All human toddlers have the same role in language evolution, to learn and perpetuate the language to which they are exposed . Slave children are not linguistic innovators, but have a role in regularization and pattern establishment. Colonial societies are not different from any other and creole languages follow patterns of historical change common to any other languages. Thus, creole formation is not an exception, it is a confirmation of a well known general pattern . The attempt to understand language evolution by evoking similarities or parallels with social and economical processes resulting from modern civilization is a mistake.
Given that, language, although clearly influenced by the human biology, is largely a product of its functions in a communicative context. In this sense the languages of some populations of modern humans which have largely preserved the ways of life for since the dawn of humanity and thus, could be viewed as living museums of the history of humanity, e.g. Pirahas, and probably other, isolated populations still to be discovered, and their linguistic experiences are the better source of information about language origins due to the similarity of functions. From a different but related perspective, given that there exist in parallel societies which experiment with space travel and others which essentially have preserved the way of life of the first humans, one must understand why the same biological material produces such radically different behavioural outcomes.

5. Protolanguage and the argument for human uniqueness

The concept of protolanguage is also based on the assumption of the cognitive and communicative exceptionality of human species. That said, despite this widely held presumption of superiority, recent studies have revealed that the current status quo argument obviously coloured by anthropocentric biases, may be an overstatement . Genetic studies reveal

traces of Neanderthal and Denisovan genomes in modern humans populations as evidence for interbreeding, suggesting intermarriages and resulting from that intertwined cultural traditions. Further similarities in anatomy, patterns of infant and child development, although significant enough to justify the conceptualization of these three branches of Homo as different species, nevertheless, appear smaller than previously thought.

Moreover, archaeological findings reveal that a number of homo species , Homo Sapiens, Neanderthal , Denisovans, co-existed and shared territory in Eurasia, Levant, Siberia for more that 50,000 years (D.Dediu and V.Levinson 2018) The territorial and temporal co-existence suggests intense interactions, which explains the striking similarities in behaviours and life style e.g. production and use of stone tools, clothing and footwear, burials, diverse diet, use of medicinal herbs, control of fire, cooking, building huts suggesting similar levels of cognitive and social complexity.

Given that, one could infer that intelligent beings, biologically, cognitively and culturally compatible with sapience , would have some form of shared communication, including some form of primitive language. In addition, the recent discovery that Neanderthals shared with humans the same variant of the FOXP2 gene, known to be implicated in language-relevant functions (J.Krause et all. 2007) is consistent with the argument against the exceptionality of humans as language users.

Moreover, recent findings suggest that Neanderthals and Denisovans had language-capable bodies and minds (D. Dediu, V.Levinson, 2018, ibid.) Most recent studies confirm (A.Barney et all. 2012) articulatory capacities comparable to those of humans contemporary to Neanderthals, suggesting cognitive ability to memorize and process a large vocabulary. Ph. Liebermann has consistently argued that non-human species were not capable of producing the quantal vowels /i, a, u / suggesting that the human vocal tract is uniquely adapted for speech. That said, even with these limitations a large vocabulary is possible. Anatomical and cognitive capacities for the command of articulate speech and language, including capacity for speech perception and production, breathing and tongue control, prolonged childhood affording possibility for learning, hierarchical planning, etc. are found in these species. (A. Barney et all. 2012, D. Dediu,V. Levinson, 2013.)

Moreover, given that even the simplest languages have some grammar, it is logical to assume that communication systems similar to human's must have been present in Neanderthal , Denisovan populations. This further suggests the presence of language-relevant capacities in non-human species, which prompts some scholars to challenge the widely held assumption that language has appeared recently, in the last 50,000 years , e.g. by Dediu and Levinson (2013) who date speech and some form of language at about 500,000 ya , thus after the separation of Sapience and Neanderthal from the common ancestor.

And although it is plausible to argue that the languages spoken 500,000 years ago(ya) were certainly not as complex as modern languages of today's industrialized societies, it is plausible to assume that they were similar to languages of human populations with pre-civilization life style, or " society of intimates", e.g. Pirahas and others, given the similarities of experiences, small population size and egalitarian social structure, known to influence linguistic behaviour and thus, the language system (T.Givon, B.Malle, 2002). These include small phoneme inventory, vocabularies in the few thousands and simple grammar .

Thus, a wide range of evidence disputes the standard stipulation of human cognitive and linguistic exceptionality. That said, although for now, and , perhaps forever, the argument for non-human language speakers will remain a conjecture, it is, nevertheless, a plausible one and a legitimate challenge for the concept of protolanguage and its place in evolutionary linguistics. Moreover, if it is proven that more than one species have evolved capacities for some form of language, this supports the argument for the adaptive value of language-relevant capacities.

6 .The concept of protolanguage reconsidered : protolanguage , UG and language evolution

So far I have argued that the concept of protolanguage is not an effective way to identify the initial stages of language evolution. And although it is very much conceivable that earlier forms of language were simpler than modern languages, we do not label the earliest versions of computers as proto-computers, or the first cars as proto-cars, neither do we refer to wolves as proto-dogs. A form of communication is either a language, or it is not. The initial stages in language evolution may have been quite rudimentary by comparison to modern form, nevertheless, they are still language, i.e. systematic mappings of meaning and structure materialized in speech.

6 .1. Rudimentary systems and the language instinct

Instincts are subconscious reactions to environmental stimuli in the form of behavioural patterns. They are fixed impulsive reactions and so, unalterable by experience. Instincts appear very early in life with very little influence from environmental triggers. Examples of instincts are nest building in birds and courtship during mating season in many species . Typically they are stereotypical behaviours, i.e., display little variation among individual members of the species. That is, instincts are behavioural universals with innate bases . They are innate responses to the animal's basic needs of nutrition, reproduction and physical safety and have evolved by Darwinian processes. All animals display instinctive behaviours. Humans are no exception, although some of our instinctive behaviours are of considerable complexity.

S.Pinker (1994) argued for a human instinct for grammar which others attributed to a grammar gene (M. Gopnik et all. 1996). Since then his argument for an instinct for grammar has faded in light of subsequent empirical support to the contrary (F. Vargha-Khadem et all. 2005) In this context a reasonable counterargument can be made that although there is no instinct for grammar, the formation of rudimentary systems, e.g. early child language, pidgins, Basic Variety (BV), the communication of aphasics, resembles instinctive behaviours in that these emerge in response to basic human needs of subsistence , safety and human interaction. The fact that children begin their linguistic experience early as a subconscious reaction to their circumstances of helpless, dependent individuals in need of nutrition, physical and emotional attention , as a result of which they form a simple but efficient communication system, speaks of heavy reliance on innate resources. That is, early child language displays similarities to instinctive behaviours in other species. There is a difference, though : language, unlike instincts proper, requires learning. This is why it is pertinent to talk about instinct-like

linguistic behaviour.

Instincts persist through the life of the individual organism as emergency responses to environmental triggers. In his context the emergence of pidgin-like rudimentary systems can be interpreted as default response to communicative emergencies. The formation of pidgins is a natural response to highly unusual circumstances where normal adult speakers of different and mutually unintelligible languages manage, by using their intuitions and ingenuity, to cobble together a simple yet very useful for the purpose , system by creating a mixture of their native languages, which makes it a default solution to a communicative emergency. This makes it similar, although not identical, to other human instincts , e.g., we all instinctively run for cover upon hearing a loud noise in anticipation of perceived danger . In a similar fashion the simplest linguistic systems act as an automatic response to emergency situations when humans normally react by retreating to default behaviours .

The case of Basic Variety /BV (W. Klein, C.Perdue 1997) is similar to pidgins in that adult native speakers of modern languages find themselves in unusual situation where they have a reaction similar to pidginization in similar circumstances applying the same type of defensive strategy. The speakers of BV, adult second language learners, are in a situation where their most frequent communicative interactions are mainly in their native language with the immediate family and the closed social circle of fellow compatriots speakers of the same language which is not the dominant language in the community. For their interactions outside their inner circle, limited in frequency and scope, with speakers of the local language they form a language system with properties similar to pidgins, i.e., Basic Variety, a simple but efficient communicative system which serves well its purpose.
The case of aphasics suggests that the capacity for primitive language systems survives injury and disease, a testament for its robustness and deep evolutionary roots.
The rudimentary systems are composed of a small lexicon of predominantly content words in their basic form, i.e. bare stem unattached to grammatical markers, organized around semantic principles. These are labels for actions, objects, persons, qualities, places, basic social relations , thus, they are well suited for encoding information pertinent to basic survival similar to those in pre-civilization conditions. In this sense the bio-cognitive underpinnings of rudimentary systems must have evolved by Darwinian principles, as Bickerton suggested (2014).
That said, I argue that the innate, instinct-like potential for rudimentary systems, a language faculty of sorts, is the only innate foundation specified for language. Importantly all rudimentary systems are externalized as spoken dialogues, which at a minimum require capacities for speech production and perception, perhaps some guiding principles for word formation (P.Bloom 2000) and a form of theory of mind which allows ostensive communication , i.e. participation in dialogues by Grician principles of conversation. Thus, a language capacity must include speech capacities.
The formation of sign languages , which in their initial stages display all the properties of rudimentary systems, is another demonstration of the instinct-like propensity for language. That said, although impulsive gesticulations accompanying spoken dialogues are taken by some scholars as demonstration of innate propensity for sign language, I find a crucial difference between the two along the lines of nature vs. nurture dichotomy. Without delving

further into this topic as it is beyond the perimeters of this article, I will only mention that sign languages are recent human inventions, a creative solution of the problem of speech impairment, prompted by the need for information and human interaction and a demonstration of human ingenuity. Thus, spoken and sign languages are expected to have different evolutionary explanations.
To note, I am agnostic as to the specific details of the human natural propensities responsible for the existence of the simplest language systems , e.g. genetic, epigenetic, developmental etc. I merely point at their instinct-like features and extrapolate from this the strong likelihood that they are explicable with phylogenesis, not glossogenesis.

6. 2 Rudimentary language systems and functionality

It is now almost unanimously acknowledged that the primary function of language is communication, i.e., exchange of information, which, by definition implies meaning. The informative function is universally carried by lexical words, while grammar is less about what information is encoded, but how it is presented . The role of grammar is to facilitate the precise and efficient communication of information.
It has long been acknowledged that various aspects of grammar in modern languages have no informative value, e.g. double marking of negation in many languages , gender assignment to nouns with inanimate meanings in Spanish, French, Russian etc. Moreover, it is not difficult to notice that the same information can be encoded both by excessively complex grammars with numerous grammatical categories and abundant irregular forms, e.g., the grammars of Latin, Russian, German, etc, as well as in language with fewer irregularities , e.g. in Turkish, as translation demonstrates.
And although linguists of generative persuasion have argued as a matter of theoretical assumptions, that complex grammar is inextricably related to complex thought (D.Bickerton 2014 among others), others (F.Newmeyer 2003; B Comrie, B., T.Kuteva, 2005) have demonstrated empirically that complex ideas are not necessarily encoded in complex linguistic forms. The existence of various grammatical categories cannot be justified with the demand for encoding complex ideas as the concepts they encode can easily be expressed with lexical means.
"...It is well known that even notions such as temporality do not necessarily need to be encoded by grammatical morphemes. " (B. Comrie, T.Kuteva, 2005, p.190).
Kikongo, a language spoken by a small community in Africa, has various grammatical markers for past tenses encoding various aspects of pastness which are superfluous, i.e., make the linguistic coding of pastness unnecessarily overly detailed without adding any meaningful semantic value (J.McWorther 2001). Moreover, such frivolous over-complications are attested in languages of communities large and small, primitive and advanced. Thus, grammar per se has little informative value.
But if communication of complex information does not need complex grammar as the same function can be accomplished with minimum grammar, then the persistent presence of elaborate grammatical forms must have a function beyond simply informing and sharing

experiences . In this sense complex grammar is better explained with preferences of communities as to how information is presented. Thus, the formation of grammatical complexity is better explained with social and cultural factors, e.g. markers of group identity which brings language diversity into the picture.

6 .3. Early language and the function of communication

To remind, information sharing is the primary function of language. Information is encoded primarily in lexical words. Early language is by definition composed overwhelmingly of lexical words in their bare forms. Thus, although communication is the primary function of modern language, communication is the only function of its early versions .
We can assume with high confidence that the communicative needs of the first speakers must have been primitive, e.g. informing others about perceived treats, organizing a hunt, or settling a dispute among rivals, etc. The simplest forms of linguistic communication are well suited for solving ecological problems in the wild as well as interpersonal and inter-tribal conflicts. One can assume with confidence that these were the ecological and social circumstance in which our ancestors living in small groups composed of extended families or/and individuals with close social ties , i.e. a " society of intimates"(T.Givon 2002, p. 301-331) were living and functioning. The close ties among communicators in a small isolated community implies that a significant portion of the information is available to all members and in communicative interactions is implicitly assumed. Moreover, pre-civilization societies are egalitarian, i.e. have have simple social structure which implies information equality, besides equality of material possessions. Even in modern communities of hunter-gatherers a good part of information is shared by non-linguistic means , e.g. songs, rituals, gesticulations, etc. which makes the use of language unnecessary and redundant. From this follows that a. the demand for information sharing is minimal, and b. the information encoded in linguistic means is a small portion of the sum total of information all members share. In these circumstances a rudimentary language system would suffice.
Moreover, rudimentary language systems must be easy to process, learn and pronounce, i.e, it must be energy-efficient in a body for which the life in the wild demands a great deal of energy. They also must be efficient in communicating a limited amount of crucial information rapidly and precisely, especially in situations of life and death. Protolanguage-like rudimentary language systems comply with these requirements. Biological and cognitive resources supporting such forms of communication will be highly adaptive. So, we can agree with Bickerton (2014) that the human potential for formation of primitive , protolanguage-like systems must be a result of Darwinian evolution. The universality of the features of these primitive systems is another strong suggestion for their phylogenetic provenance.
Thus, the bio-cognitive adaptations for primitive language systems are adaptations to the natural and social environments of the early speakers.

Grammatical redundancies of the kind, mentioned above, on the other hand, have limited informative value, especially in pre-civilization habitats . Moreover, complex grammar has high energy demands, both cognitive and physiological, as it takes longer to process and

articulate, which a human body living in pre-civilization conditions cannot afford .

These are major reasons why the current generative/biolinguistic orthodoxy of dichotomy of protolanguage vs. language, maintained in most recent publications, eg. M. Arbib (2017), innate explanation for the complexity of grammatical detail, even in its minimalist edition (Chomsky, 1995), seems unlikely. And even if one imagines a scenario of accidental emergence of a grammar organ, given the high energy demands involved and little contribution to survival, by evolutionary principles its bearer/s would not have survived. In this sense a phylogenetic explanation for UG is unconvincing.

R. Jackendoff in his interpretation of the Language Faculty as Parallel Architecture (2002 and elsewhere) favours continuity of protolanguage and language. That said, his assumption of innate resources for a wide diversity of grammatical systems reflecting the communicative needs of modern civilization, presumably having evolved in pre-civilization context, makes his hypothesis equally unconvincing.

All this points at the likelihood that the simplest linguistic systems exemplified by the most rudimentary forms of linguistic communication have the best chance of fulfilling the communicative needs of the first speakers in the natural environment where they were functioning and surviving.

6 .4 . Modern language and its multi-functionality

Rudimentary forms of language serve the needs of navigating the natural, i.e. material, reality and aids the biological survival of its users. Because of these survival benefits the human organism has been slightly altered in specific ways by Darwinian processes to allow fast and painless learning and processing of a primitive form of linguistic communication in spoken form as a survival strategy in the natural environment as part of human speciation. Given that, the inquiry of language phylogenesis should be reformulated as understanding the phylogenesis of a Language Capacity for the simplest forms of language.

Elaborate grammatical forms are used for functions beyond basic necessities. The need for them arises when communities are preoccupied with more than biological survival and build civilizations. Civilizations, even primitive ones, develop cultural traditions, myths of creation, songs, poetry, etc. and invent a " social reality (J.Searle ,1995) to complement , and complicate the physical reality. They also create division of labour, social stratification, which creates information inequality , i.e. new types of social relations and with that the demand for very different functions for language. In this new context of complex and elaborate human relations in modern multicultural and multiethnic societies language systems of extensive grammatical complexity are developed in response to new demands for language use as marking the social, cultural , ethnic identity of populations. This could explain the ubiquity of functionless elements in grammars. Moreover, typologists have found that languages encode the same information in vastly different grammatical categories (M. Haspelmath, 2007) which can be attributed to the demands for demarkation of group identity.

Moreover, the new, extended functions of language were fulfilled by the invention of writing

which eliminates the demand for fast and accurate processing of a stream of speech as ephemeral signal. In this context the processing of complex language in writing is not hampered by energy limitations and does not need to be maximally energy - efficient as it is not time-constrained and does not arise out of survival necessity.

In short, simple languages with pidgin-like characteristics are born out of survival necessity, complex languages are born out of the communicative demands of civilization where the focus of a community changes from biological survival to establishing social and ethnic identity. Bickerton (2014) is right to say that grammar is more than nature needs. This is why nature did not supply capacities for complex grammar in the form of UG as these come from nurture, i.e. glossogenesis. Nevertheless, nature designed very specific ingredients and canvased a path for nurture to work.

Summary and conclusions

The concept of "protolanguage" defined by Bickerton as " lexicon without grammar" is currently still held in high regard as a significant epistemic contribution to the study of language evolution.
That said, I have argued , I hope, convincingly, that its original form as a hypothesis based on a number of unfounded and empirically unjustified assumptions, is ill-conceived.
In conclusion, the concept of "protolanguage" is a conjecture based on outdated theoretical convictions and contradicted by empirical findings, suggesting that its epistemic prominence is unjustified, prompting the need for its reevaluation.
As the study of language evolution progresses from a compilation of ' just so stories" based on idealizations and conjectures into a legitimate scientific discipline, capable of objective observations and producing testable hypotheses, key concepts will inevitably be reexamined . In the process of this transition previously prominent theoretical convictions will inevitably be scrutinized and reevaluated. The concept of "protolanguage " is one such example. Its reinvention in terms of rudimentary systems and the stemming from that reinterpretation of the Language Faculty, seems fruitful for future inquiries in the evolution of language.
To note, although the concept of protolanguage is now firmly established in the conceptual instrumentarium of evolutionary linguistics and features prominently in the vocabulary of the majority of scholars, progress in science is made by questioning established views, even when they are held by the majority.

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