

So all languages aren't equally complex after all

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1. All languages are born equal.

People outside the specialised sphere of linguistics have generally taken it for granted that, just as there are simple and complex cultures there would correspondingly be simple and complex languages. But for most of the last hundred years linguists have claimed that even if some cultures are simpler than others, all languages are equally complex: ALEC, or uniformitarianism. 'There are Stone Age societies, but there is no such thing as a Stone Age Language. Earlier in this [20th] century the anthropological linguist Edward Sapir wrote, "When it comes to linguistic form, Plato walks with the Macedonian swineherd, Confucius with the head-hunting savage of Assam" ' (Pinker 2015:25). Or again, '[N]o sign of evolution from a simpler to a more complex state of development can be found in any of the thousands of languages known to exist or to have existed in the past'(Lyons 1977 (I):85, and see Lyons 1970: 21-22). Or, as a fairly recent linguistics textbook has said, 'All languages are equally complex and equally capable of expressing any idea' (Fromkin et al. 2010:34)¹.

Indeed, many would also dispute that there are 'StoneAge' societies, and argue that non-industrial peoples had systems of language, knowledge, and culture as complex and valid in their world view as our own. As one anthropologist has said, 'All people are essentially equal in their ability to become cultured, and all people encounter approximately the same amount of information in the process of enculturation. Thus it is untenable to maintain that one culture is "higher" or more complex than another. In reality, there are no simple or primitive cultures: all cultures are equally complex and equally modern' (Hamill 1990:106). Or again, '[People] think the same thoughts, no matter what kind of grammatical system they use; and they express the same kinds of thoughts, regardless of the grammatical tools they have: past, present and future

events, cause and effect relationships, social relationships, hypothetical questions, and so forth' (Jackendoff and Wittenberg 2014: 66).

. There is no doubt that egalitarian ideology has been a very powerful motivation for this belief. 'The reason why linguistics was worth studying, for many descriptivists [such as Sapir and Boas], was that it helped to demonstrate that "all men are brothers" – Mankind is not divided into a group of civilized nations or races who think in subtle and complex ways, and another group of primitive societies with crudely simple languages' (Sampson 2009a: 4). But while linguists could justifiably point out that some languages spoken by tribal peoples could be grammatically and phonologically more complex than some European languages, there was no systematic attempt to find evidence for the general theory of uniformitarianism. Hockett, for example, simply maintained that the total grammatical complexity of any language was more or less bound to be the same as any other's, 'since all languages have about equally complex jobs to do' (1958:180), a very strange assumption indeed, as we shall see.

When the traditional 'descriptive' linguistics of Sapir and others² was replaced by the generative linguistics (which became Universal Grammar) of Chomsky and his school, the dogma of equal complexity remained the same:

If we come forward to the generative linguistics of the last forty-odd years, we find that linguists are no longer interested in discussing whether language structure reflects a society's cultural level, because generative linguists do not see language structure as an aspect of human culture. Except for minor details, they believe it is determined by human biology, and in consequence there is no question of some languages being structurally more complex than other languages – in essence they are all structurally identical to one another. Of course there are some parameters which are set differently in different languages: adjectives precede nouns in English but follow nouns in French. But choice of parameter settings is a matter of detail that specifies how an individual language expresses a universal range of logical distinctions – it does not allow languages to differ from one another with respect to the overall complexity of the set of distinctions expressed, and it does not admit any historical evolution with respect to that complexity...The innate cognitive machinery which is central to the generative concept of language competence is taken to be too comprehensive to leave room for significant differences with respect to complexity (Sampson 2009a:6-7).

2. The aims of this paper

In the general context of what we know about biological, social and cultural development the claim that all languages are equally complex is extremely odd. Biological organisms have obviously evolved increasingly complex forms, in the sense of having an increasing number of component parts, specialisation of function, and hierarchical structures, and the same process can be observed in social organization, culture, and technology. Why, then, should language be any different? As a social anthropologist who conducted several years' fieldwork among the Konso of Ethiopia (Hallpike 2008), and the Tauade of Papua New Guinea (Hallpike 1977), it has always been obvious to me from personal experience that claims that 'all cultures are equally complex' are simply untrue, and my belief is supported by a vast ethnographic literature (see Hallpike 1992 for a summary). I also applied Piagetian developmental psychology to the data of small-scale, non-literate societies with subsistence economies ('primitive societies') in *The Foundations of Primitive Thought* (1979) and *Ethical Thought in Increasingly Complex Societies* (2016). These assembled a wealth of evidence to show that modes of thought about the natural world, causality, classification, notions of the self, society, and ethics do indeed follow a developmental pathway, and that the thought worlds of modern literate urban societies are very different from those found in primitive societies. This work also refuted the standard anthropological dogma that individual psychology cannot be used to explain collective representations, and showed that since culture can only be transmitted through individuals, their psychology has to be an integral part in the formation of these collective representations.

Language is perhaps the pre-eminent example of a collective representation, although not being a linguist I did not feel professionally competent to challenge the doctrine of ALEC. But I have recently been encouraged³ to find that it, together with Chomsky's Universal Grammar, are increasingly being rejected by linguists, and I have tried here to summarise their main conclusions for the benefit of anthropologists. The main theme of this paper is therefore a critique of the theory that language can be a genetically based 'organ', 'instinct', or 'module', and aims to show that, while clearly the language *capacity* depends on some unique and evolved qualities of the human brain, the characteristics of natural languages cannot be understood unless they are also placed in the context of social relations and the ways in which these have developed in the course of history.

3. Chomsky and Universal Grammar

Chomsky began developing his theory of Universal Grammar or UG in the 1950's to demonstrate that language, or more specifically grammar (syntax + morphology), is a distinct cognitive function that is innate and genetically specified, a mental 'organ' with very detailed characteristics like the heart or the eye. In adopting this approach Chomsky was in perfectly orthodox scientific company, since the prevailing view of the brain was that known as 'localizationalism': '...the idea that the brain is like a complex machine, made up of parts, each of which performs a specific mental function and exists in a genetically predetermined or hardwired *location* – hence the name' (Doidge 2007: 12). This view of language was highly compatible with subsequent developments in computer science by which it could be represented as a specific computational programme, and later also formed close links with 'evolutionary psychology', that grew up with socio-biology in the 1980's. This claimed that every mental function was a 'module', an encapsulated computational device evolved to solve all the various problems that our ancestors had encountered during the Pleistocene, whether it be detecting cheaters, child-care, mathematics, tool-use or of course language.

Chomsky used the theory of Universal Grammar very effectively to refute Skinner's Behaviourist claim (Chomsky 1959) that speech could be explained without any reference to a supposed 'mind', but purely as the product of operant conditioning in which items of 'verbal behaviour' were emitted in response to particular stimuli, and then subject to reinforcement. Chomsky pointed out however that children were able to utter grammatically well-formed statements that they had never heard before, and could attain correct grammar without being constantly corrected, or even corrected at all. Behaviourist theory was quite incapable of answering these objections which were decisive. For Chomsky, then, the basic justifications for saying that the capacity for language must be an innate module or organ, a computational mechanism, was the argument from the poverty of the input together with lack of correction, and ease of acquisition in childhood (Pinker 2015: 40).

[H]uman cognitive systems, when seriously investigated, prove to be no less marvellous and intricate than the physical structures that develop in the life of the organism. Why, then, should we not study the acquisition of a cognitive structure such as language more or less as we study some complex bodily organ?' (Chomsky 1975: 10). 'What many linguists call "universal grammar" may be regarded as a theory

of innate mechanisms, an underlying biological matrix that provides a framework within which the growth of language proceeds' (Chomsky 1980a: 187).

For Chomsky the basic or defining element of the language organ is recursion, recursion not simply in the sense of iteration, repeating the same process indefinitely, but in the sense of taking the output of one stage in a process and making it the input of the next stage:

'...lying at the heart of language: its capacity for limitless expressive power, captured by the notion of discrete infinity. ...no species other than humans has a comparable capacity to recombine meaningful units into an unlimited variety of *larger structures* [my emphasis], each differing systematically in meaning.' (Hauser, Chomsky & Fitch 2002: 1576)

Recursion, then, in this sense is the structure-building process *par excellence*, particularly the process linguists refer to as embedding, in which one clause is included or subordinated in another:

Natural languages go beyond purely local structure [e.g. phrases] by *including a capacity for recursive embedding of phrases within phrases*, which can lead to statistical regularities that are separated by an arbitrary number of words or phrases [e.g. in the sentence 'The man whom you saw yesterday speaks French' the subject 'man' is separated from the verb 'speaks' by the four words of the relative clause]. Such long-distance, hierarchical relationships are found *in all natural languages* [my emphases]...' (ibid., 1577).

Linguists have generally made a clear distinction between iteration and recursion, whose distinctive property is the embedding of phrases or sentences within larger phrases or sentences. Unfortunately, Chomsky in the same paper also says that recursion 'takes a finite set of elements and yields a potentially infinite array of discrete expressions' (ibid., 1571) and had previously substantially revised his notion of UG by reducing it to the fundamental principle of Merge. This simply 'takes a pair of syntactic objects and replaces them by a new combined syntactic object' (Chomsky 1995: 226), and appears in fact to blur substantially the distinction between recursion and iteration. Bickerton (2009: 536-7) indeed claims that iteration in the form of Merge can achieve the same results as recursion in the traditional sense. Some linguists have even concluded that any expression of more than two words must involve recursion-as-iteration, which is singularly unhelpful. This is a debate that one must therefore leave to linguists; but the fact remains that the concept of recursion as requiring embedding, subordinate clauses, is an extremely important cognitive process that is highly relevant to the notion of linguistic complexity and is also testable:

...the core idea of recursion is clear and unambiguous, and it is the simplest and most powerful route to the type of unbounded expressive power that is a crucial feature of mathematics or language ...Recursive embedding of phrases within phrases is an important tool allowing language users to express *any* concept that can be conceived, to whatever degree of accuracy or abstraction is needed. The achievements of human science, philosophy, literature, law, and of culture in general depend, centrally, upon there being no limit to how specific (or how general) the referents of our linguistic utterances can be (Fitch 2010: 89).

For the purposes of this paper I shall therefore ignore the implications of Merge, and concentrate on the theory that language is genetically based in a 'language organ', and that its most important manifestation is recursive embedding.

But, unlike the earlier descriptivist linguists like Boas and Sapir, who made intensive field-studies of the languages of the Native Peoples of North America, Chomsky based his theories essentially on English. He defended this as follows:

...I have not hesitated to propose a general principle of linguistic structure on the basis of observation of a single language. The inference is legitimate, on the assumption that humans are not specifically adapted to learn one rather than another human language, say English rather than Japanese. Assuming that the genetically determined language faculty is a common human possession, we may conclude that a principle of language is universal if we are led to postulate it as a "precondition" for the acquisition of a single language (Chomsky 1980b: 48).

In rather the same way, perhaps, Newtonian physics might defend itself by saying that although it was based on the study of only one solar system, the laws inferred from this were universal. But in the course of time it became clear that languages from non-literate peoples in particular departed in major ways from this English-derived model, and the language organ now includes what have come to be known as 'Principles and Parameters'. 'Principles' are the *universals* of language, whereas 'Parameters' respond to linguistic *differences*: they are the fundamental options or possibilities in generating the grammar of a language: '...also specified are the relevant principles and parameters common to the species and part of the initial state of the organism; these principles and parameters make up part of the theory of grammar or Universal Grammar, and they belong to the genotype' (Anderson and Lightfoot 2000: 14). One parameter, for example, is word order, and it seems that 95% of the world's languages are either SVO, like English, or SOV like German. Another is the 'Null-Subject' parameter: with English verbs it is not permissible to omit the subject and say simply 'is raining': the form 'it is raining' is required, even though 'it' has a purely grammatical function here. In Italian, however, the form '*piove*', 'is raining' is quite correct, and this null-subject parameter also explains a number

of other related aspects of the grammars of English and Italian, and many other languages (Baker 2001:36-44)⁴.

So we now find very strong claims for the scope of the ‘language organ’, for example:

All languages have a vocabulary in the thousands or tens of thousands, sorted into part-of-speech categories including noun and verb. Words are organized into phrases according to the X-bar system (nouns are found inside N-bars, which are found inside noun phrases, and so on). The higher levels of phrase structure include auxiliaries...which signify tense, modality, aspect, and negation. Nouns are marked for case and assigned semantic roles by the mental dictionary entry of the verb or other predicate. Phrases can be moved from their deep structure positions, leaving a gap or ‘trace’, by a structure-dependent movement rule, thereby forming questions, relative clauses, passives, and other widespread constructions. New word structures can be created and modified by derivational and inflectional rules. Inflectional rules primarily mark nouns for case and number, and mark verbs for tense, aspect, mood, voice, negation, and agreement with subjects and objects in number, gender, and person (Pinker 2015: 235-6).

And some linguists make equally strong claims for the scope of a genetic basis of language: ‘Much remains to be done, but ...[e]ventually, the growth of language in a child will be viewed as similar to the growth of hair: just as hair emerges with a certain level of light, air, and protein, so, too, a biologically regulated language organ necessarily emerges under exposure to a random speech community’ (Anderson and Lightfoot 2000: 21).

Finally, we need to consider Chomsky’s explanation for how such a genetically based ‘language organ’ could have developed in the first place. Strikingly, unlike Pinker and many others, he does not believe that it was the product of natural selection at all. This is because he also dismisses the general assumption that the origins of language must have been in the context of *communication*, that, if you like, there is no point in speaking if there is no one else who can understand what is being said. He maintains that the ‘language organ’ resulted from a major genetic mutation, probably within the last 100,000 years:

Within some small group from which we are descended, a rewiring of the brain took place in some individual, call him *Prometheus*, yielding the operation of unbounded Merge, applying to concepts with intricate (and little understood) properties...Prometheus’s language provides him with an intricate array of structured expressions with interpretations of the kind illustrated: duality of semantics, operator-variable constructions...Prometheus had many advantages: capacities for complex thought, planning, interpretation, and so on. The capacity would then be transmitted to offspring, coming to predominate...At that stage there would be an advantage to externalization, so the capacity might come to be linked as a secondary process to the S[ensory]M[otor] system, for externalization and interaction, including communication [through speech]...’ (Chomsky 2010:59).

Prometheus's mutation, in other words, initially applied only to Inner thought, Mentalese, I[internal]-Language, not to E[external]-Language or real speech. This refers to the fact that there has to be a distinction between thoughts and words: we are all aware, for example, of searching for just the right word to express an idea we have, of feeling we have not expressed our meaning very well, of objecting to someone's theory before we have actually put our objection into words, and so on. But it is not in the least obvious how this mutation could have conferred any capacity for 'complex thought' in the absence of any social interaction, or any language in which to exchange these thoughts. Chomsky nevertheless maintains that the mutation in question was about our increased ability to think with precision, not to communicate any better, and that this in itself would have been of sufficient adaptive advantage to Prometheus to ensure the propagation of the language gene:

Salvador Luria was the most forceful advocate of the view that communicative needs would not have provided "any great selective pressure to produce a system such as language," with its crucial relation to "the development of abstract or productive thinking." The same idea was taken up by his fellow Nobel laureate François Jacob, who suggested that "the role of language as a communication system between individuals would have come about only secondarily, as many linguists believe...The quality of language that makes it unique does not seem to be so much its role in communicating directives for action" or other common features of animal communication, but rather "its role in symbolizing, in evoking cognitive images", in "molding" our notion of reality and yielding our capacity for thought and planning, through its unique property of allowing "infinite combinations of symbols" and therefore "mental creation of possible worlds" (Chomsky 2010: 55).

4. Is a 'language organ' actually possible?

There are, unsurprisingly, a number of objections to this view of the language organ and U[niversal] G[rammar]. (As previously mentioned, this is now referred to as the Minimalist principle of unbounded Merge but for simplicity I shall continue to refer to UG.) The first is that it is bizarre to claim that language can be a physical organ in the same sense as the heart or the eye. These have standard forms and functions, which are genetically determined and entirely material in nature, and are also confined to the operation of the body of which they are parts. Language, on the other hand, although having some kind of genetic basis is also, unlike the bodily organs, a *social* phenomenon produced by the interaction of many minds, and is also concerned with the communication of non-material *meaning* between a number of individuals. Like the brain of which it is one function among many, but unlike all the other bodily organs, it is capable of limitless diversity, and it can also develop very different levels of complexity, again

unlike all other bodily organs. The idea that language is an organ like the heart or the eye is therefore vastly underdetermined by the evidence.

The next objection is that, when faced with Chomsky's mythical Prometheus, whose ability to master the most complex syntax suddenly appeared fully formed in his brain, we need to remind ourselves of a basic principle of natural selection. This is that a trait can only be selected if it is relevant to the existing circumstances in which an organism is living, not those that might exist in the future. This point was made long ago by A.R. Wallace, the co-formulator of the theory of natural selection with Darwin, and who had extensive first-hand acquaintance with hunter-gatherers of the Amazon and south-east Asia. He noted that on the one hand their mode of life made only very limited intellectual demands, and did not require abstract concepts of number and geometry, space, time, and advanced ethical principles, or music, yet they were potentially capable of mastering the advanced cognitive skills of modern industrial civilisation. Since natural selection can only produce traits that are adapted to existing, and not future, conditions, it 'could only have endowed savage man with a brain a little superior to that of an ape, where he actually possesses one little inferior to that of a philosopher' (Wallace 1871:356). But how could the language organ have developed the capacity for the highly complex syntactic structures involved in, say, modern legal or philosophical arguments tens of thousands of years before they were needed or relevant to the simple lives of hunter-gatherers?

Chomsky, of course, would dismiss Wallace's point on the grounds that the linguistic ability of Prometheus was not produced by natural selection at all, but by an amazing mutation instead. This escape of Prometheus from what might seem an impossible evolutionary situation is about as implausible as the legendary escape of Jack, the hero of a thriller series, from apparently inevitable death by the explanation that 'with one bound Jack was free'. Evolutionary psychologists such as Pinker naturally disagree fundamentally with Chomsky and maintain that communication was basic, and that language is only one of a large number of 'modules' in the brain that have evolved over millions of years through natural selection. According to Pinker, 'The mind is organized into modules or mental organs, each with a specialized design that makes it an expert in one arena of interaction with the world. The modules' basic logic is specified by our genetic program' (Pinker 1997:21), and language is just one module among very many. These modules are supposed to have been shaped by natural selection during the several million

years of hunter-gatherer life the Pleistocene in East Africa, the ‘environment of evolutionary adaptation’ or EEA (about which, incidentally, we know virtually nothing). So

Just as one can now flip open Gray’s *Anatomy* to any page and find an intricately detailed depiction of some part of our evolved species-typical morphology, we anticipate that in 50 or 100 years one will be able to pick up an equivalent work for psychology and find in it detailed information-processing descriptions of the multitude of evolved species-typical adaptations of the human mind, including how they are mapped on to the corresponding neuro-anatomy and how they are constructed by developmental programs. (Tooby and Cosmides 1992:69)

Mathematics is another of these alleged modules, and its comparison with the language ‘organ’ is illuminating here. Unlike language, which is both universal and very ancient, mathematics much beyond the level of simple tallying only emerged in the high cultures of recorded history, and its expert practitioners have always been a small minority of any population. According to Pinker, ‘Mathematics is part of our birthright’ (1997: 338), but this is only true in a very rudimentary sense. When collections of objects are less than ten, a wide variety of species such as pigeons, ravens, parrots, rats, monkeys, and chimpanzees can recognise changes in the numbers of objects in a collection, compare the sizes of two collections presented simultaneously, and remember the number of objects presented successively (Koehler 1951, Pepperberg 1987, Mechner & Guerrekian 1962, Woodruff & Premack 1981, Matsuzawa 1985).

A sense of what has been called ‘numerosity’, then, of the differences in quantities of small size, is widespread, and to this extent the human ‘mathematical birthright’ is not distinguishable from that of many other species. So many simple cultures, especially hunter-gatherers but including some shifting cultivators such as the Tauade of Papua New Guinea (Hallpike 1977), may only have words for single, pair, and many. Indeed, the hunter-gatherer Piraha of South America are described by Everett (2008) as having no number words at all, not even the grammatical distinction between singular and plural, but we shall come back to them in more detail later.

We can get a good idea why this should be so from the example of a Cree hunter from eastern Canada: he was asked in a court case involving land how many rivers there were in his hunting territory, and did not know:

The hunter knew every river in his territory individually and therefore had no need to know how many there were. Indeed, he would know each stretch of each river as an individual thing and therefore had no need to know in numerical terms how long the rivers were. The point of

the story is that we count things when *we are ignorant of their individual identity* [my emphasis] – this can arise when we don't have enough experience of the objects, when there are too many of them to know individually, or when they are all the same, none of which conditions obtain very often for a hunter. If he has several knives they will be known individually by their different sizes, shapes, and specialized uses. If he has several pairs of moccasins they will be worn to different degrees, having been made at different times, and may be of different materials and design. (Denny 1986:133)

Again, the Tauade, like many peoples of Papua New Guinea, only had words for single, *kone*, and pair, *kupariai*. 'Single' and 'pair', it should be emphasized, are not the same as one and two: 2 is 1+1, and 3 is 1+1+1, successive elements of a series, but 'single' and 'pair' are not components of a series but are *configurations* that can take many different forms. For example there are pairs of twins, or a man and a woman, a man and a man, and a woman and a woman, or left and right, or sun and moon, and so on which each have different social and symbolic significance, whereas there can't be different kinds of 1 or 2. Although the Tauade engage in complex transactions of pork exchange they have never needed to use a counting system to keep track of these because each exchange is unique, between different persons, for different purposes and in different circumstances. Here again, like the Cree, *distinctive individual identity* is key to the lack of number and counting. (The Tauade had only recently adopted the Tok Pisin number system based on ten because they had to deal with modern money whose coins and notes have no individual identity.) What needs to be emphasised here, therefore, is that in hunter-gatherer societies especially, it is perfectly possible to survive without the need for verbal numerals or for counting, and that consequently there could have been no selective pressure for arithmetical skills to evolve in the specific conditions of the EEA, and for any specific module to develop. So are we really expected to believe that a mathematics module, with all its capacity to produce modern mathematics, nevertheless did develop but mysteriously sat there in silence, as it were, until the emergence of complex societies?

As we all know, mathematics has only flowered in the last few centuries, far too brief a time-span for natural selection to have had the least effect, and it has developed out of all recognition from the simple counting systems of tribal societies. While the relatively small number of those who excel at mathematics presumably have some genetic advantage over the rest of us, the historical development of mathematics must have depended on a number of more general and pre-existing mental functions that were put to use in the development of mathematics, itself

reacting to the changing circumstances of the social milieu.

Evolutionary psychologists like Pinker would reply, of course, that there is indeed a module for mathematics, just as there is for most aspects of mental functioning. For example, Hauser in *Moral Minds* (2008) claims that we have an innate morality module, a ‘universal moral grammar’, basically similar to Chomsky’s generative grammar for language. Just as our innate generative grammar allows us to construct a limitless variety of correct sentences, so Hauser proposes that our universal moral grammar has ‘a capacity that enables each individual to unconsciously and automatically evaluate a limitless variety of actions in terms of principles that dictate what is permissible, obligatory, or forbidden’ (ibid., 41). Moral thought, however, evolves in relation to social complexity, as I have shown in detail in *Ethical Thought in Increasingly Complex Societies* (2016) which is incompatible with modularity. How, in any case, did natural selection manage to endow us with a module that could foresee the moral dilemmas we would face in complex industrial societies thousands of years before these had developed?

In short, then, Wallace’s argument demonstrates a fatal weakness in all evolutionary psychology which is that natural selection can only improve adaptation to *existing* circumstances, never to those that might arise in the future (and see Hallpike 2011 for a number of other objections). Instead of the adaptationism of natural selection we therefore need to appeal to Stephen J. Gould’s notion of ‘exaptation’. Whereas ‘adaptations’ are characteristics evolved under natural selection for the better performance of some task or function, there can also be characteristics that have proved to be useful, but which were not initially selected for such a use:

We suggest that such characters, evolved for other usages (or for no function at all) and later ‘coopted’ for their current role, be called *exaptations*. . . They are fit for their current role, hence *aptus*, but they were not designed for it, and are therefore not *ad aptus*, or pushed towards fitness. They owe their fitness to features present for other reasons, and are therefore *fit (aptus) by reason of (ex) their form*... Adaptations have functions; exaptations have effects. (Gould and Vrba 1982:6)

Most of what the brain now does to enhance our survival lies in the domain of exaptation – and does not allow us to make hypotheses about the selective paths of human history. How much of the evolutionary literature on human behaviour would collapse if we incorporated the principle of exaptation into the core of evolutionary thinking? This collapse would be constructive because it would vastly broaden our range of hypotheses, and focus attention on current function and development (all testable propositions) instead of leading us to unprovable reveries about primal fratricide on the African savanna or dispatching mammoths at the edge of great ice sheets – a valid subject, but one better treated in novels. . . (ibid., 13)

Or, one might add, reveries about Prometheus on the African savanna as well.

In the years since the inception of UG our knowledge of how the brain works has increased exponentially, and the whole idea of mental modules is now distinctly *passé*. For example ‘...there are many different system organizations that can produce the same kind of behaviour a strictly modular system does and...they may not be distinguishable from it by any conceivable experimental strategy....Nonlinear, interconnected, dynamic systems [such as the brain] are fully capable of producing the kind of behaviour expected from modular systems’ (Uttal 2001:182-3).

Indeed, culture itself can modify the way in which the brain operates:

Neuroplastic research has shown us that every sustained activity ever mapped – including physical activities, sensory activities, learning, thinking, and imagining – changes the brain as well as the mind. Cultural ideas and activities are no exception. Our brains are modified by the cultural activities we do – be they reading, studying music, or learning new languages. We all have what might be called a culturally modified brain, and as cultures evolve, they continually lead to new changes in the brain (Dooidge 2007: 288).

While there is undoubtedly some cognitive specialisation in the brain, as in the different functions of the two hemispheres (see McGilchrist 2012), there must be a limit to this:

It would simply not be feasible to construct a brain that allocates a specific psychological module to every conceivable event an individual might encounter, as the costs in terms of neural circuitry and information processing would be huge. There is no intrinsic virtue to mental specificity: general solutions will be favoured when they can do a good enough job at low cost...Domain-general processes are no more incompatible with evolutionary theory than domain-specific processes. (Laland and Brown 2002:182-3)

It has often been suggested that language originated either from music or from gesture, and whatever truth there may be in either of these evolutionary theories, there is no doubt that as the brain operates today there are close, and very unmodular, links between these areas and those of speech and language:

The location of grasp in the left hemisphere, close to speech, is not accidental and tells us something. We know from experience that there are many connections between the hand and language. For example, there is clearly a close relationship between spoken language and the wealth of gesture language that often accompanies it. In normal subjects, restricting hand movement produces an adverse effect on the content and fluency of speech...At the neurophysiological level, too, it turns out that there are similarities between the skills required for hand movement, specifically movement of the right hand...Manipulospacial abilities may have provided the basis of primitive language, and such abilities and referential language require similar neural mechanisms. The syntactic elements of language may well derive from gesture (McGilchrist 2012:111).

Music, too, far from being some trivial side-effect of brain activity, also has fundamental links with language:

In the first place, the ‘syntax’ of music is simpler, less highly evolved than that of language, suggesting an earlier origin. More importantly, observation of the development of language in children confirms that the musical aspects of language do indeed come first. Intonation, phrasing and rhythm develop first; syntax and vocabulary come only later (ibid., 103).

McGilchrist also points out that music, like gesture, has a profoundly social dimension:

If language began in music, it began in (right hemisphere) functions which are related to empathy and common life, not competition and division; promoting togetherness, or, as I would prefer, ‘betweenness’. By its nature as a means of communication, language is inevitably a shared activity, like music, which begins in the transmission of emotion and promotes cohesion. Human singing is unique: no other creature begins to synchronise the rhythm, or blend the pitch, of its utterances with that of its fellows, in the way that human singing instinctively does. It is not, like birdsong, individualistic in intention and competitive in nature (remember that birdsong, like other instrumental utterances, is grounded in the left hemisphere, not, like human music, in the right) (ibid., 123).

Again, metaphor, and analogy which is its extension, are basic aspects of human thought. ‘Only the right hemisphere has the capacity to understand metaphor...Metaphoric thinking is fundamental to our understanding of the world, because it is the only way in which understanding can reach outside the systems of signs to life itself. It is what links language to life’ (ibid., 115).

But metaphor and analogy are not computational exercises, nor are the writing of poems, plays, and novels, music, painting or sculpture. Religion, politics, and social life in general are not computational exercises either, because, as in the arts, there are no problems or clearly defined set of problems that any of these activities has evolved to solve during the Pleistocene; there are no set of rules for doing so; and no agreed criteria for deciding if the output is right or wrong. Fodor himself, who originally popularized the idea of mental modules, emphasizes that analogical thinking in general cannot be modular and has to be global:

It is strange that, while everybody thinks that analogical reasoning is an important ingredient in all sorts of cognitive achievements that we prize, nobody knows anything about how it works; not even in the dim, in-a-glass-darkly sort of way in which there are some ideas about how confirmation works. I don’t think this is an accident either. In fact, I should like to propose a generalization...It goes like this: the more global...a cognitive process is, the less anybody understands it. *Very* global processes, like analogical reasoning, aren’t understood at all. (Fodor 1983:107)

Finally, while UG was able to give an explanation of linguistic diversity by the principles and parameters theory, that to the non-linguist at least appears very impressive, it is much harder to see how such a module could possibly account for the *developmental* aspects of language other than, of course by simply denying that they can exist - ALEC. The point here is that if there is a genetically based faculty like language, an ‘organ of the mind’, one would expect it to operate in a unitary fashion with all the parameters set, and not for some aspects of it to take many millennia to emerge when circumstances are right. This is especially true of recursion, supposedly the very heart of the language instinct, yet which as we shall see may be very weakly developed or even non-existent in the simpler languages. If, on the other hand, we find that linguistic complexity does develop in relation to social and cultural complexity, particularly in relation to writing and literacy, then how is it to be distinguished from other aspects of learned behaviour, that are derived from the rest of human culture that has been collectively constructed over a very long period by individuals with the unique general capacities of the human brain? What empirical test would there be, in other words, to distinguish an innate language organ from the product of a *constructive* and *developmental* process of the kind proposed by Piaget?

Fifty years of experience have taught us that knowledge does not result from a mere recording of observations without a structuring activity on the part of the subject. Nor do any a priori or innate cognitive structures exist in man; the functioning of intelligence alone is hereditary and creates structures only through an organization of successive actions performed on objects⁵. Consequently, an epistemology conforming to the data of psychogenesis could be neither empiricist nor preformationist, but could consist only of a constructivism, with a continual elaboration of new operations and structures. The central problem, then, is to understand how such operations come about, and why, even though they result from non-predetermined constructions, they eventually become logically necessary (Piaget 1980: 23)

It is mental activities, not structures, then, that will be innate, and since language is a linear, one-dimensional mode of communication, we can also expect to find that it will obey certain simple constraints on conveying meaning, that as Greenberg proposed, certain sequences of syntactic elements will give optimal cues for parsing (conveying and extracting meaning). Rather than proposing the unverifiable theory that structures like embedding are ‘latent’ in the language organ, as UG theorists would have it, one would therefore suggest instead a set of functional arguments to account for universal trends in language development that will also be limited in number (Prof.J.Colarusso, personal communication).

5. Linguistic simplicity and linguistic complexity

Pinker gives a useful description of the essential features of human language:

The discrete combinatorial system called “grammar” makes human language infinite (there is no limit to the number of complex words or sentences in a language), digital (this infinity is achieved by rearranging discrete elements in particular orders and combinations, not by varying some signal along a continuum like the mercury in a thermometer), and compositional (each of the infinite combinations has a different meaning predictable from the meanings of its parts and the rules and principles arranging them)’ (Pinker 2015:332).

But within this definition, language forms a spectrum from the simple to the complex that is related to the level of sociocultural complexity. There has been a great deal of debate about what we mean by ‘linguistic complexity’, and how it is to be measured, if at all (see in particular Newmayer and Preston 2014). But it is nevertheless possible to observe an important difference between those aspects of grammar that have developmental significance and those that do not. In the second category are, for example: phonology⁶; differences of word order; the presence or absence of case and gender, so that in German there are 16 possible ways of saying the single English word ‘the’; the distinctions between isolating and synthetic languages (English and Latin), and between these languages and polysynthetic languages such as Mohawk; head-initial and head-final languages (English and Japanese); ergative/absolutive or nominative/ accusative languages (Basque and German), the null-subject parameter (English and Italian), and many others, which can be found all over the world regardless of the social and cultural complexity of their speakers.

On the other hand, there are a number of linguistic features that have strong developmental correlations. First of all we should be clear that, despite the strange claims of some linguists to the contrary, the lexicons of primitive societies, and pre-modern societies for that matter, will be considerably smaller than those typical of modern industrial societies. For example, we can say anything that Chaucer could have said, but Chaucerian English would be woefully inadequate in the modern world. Grammatical differences are also obvious. The first and most important of these concerns recursion itself, the lack of subordinate clauses or embedding, which is very weak or even absent in the simpler languages, and instead we find strings of short phrases strung together paratactically with very simple SOV/SVO syntax and minimal use of pre/postpositions. In fact Progovac provides examples of ‘root small clauses’ also

lacking the ‘Tense Phrase’ layer of the verb, and these can be used in complex languages as well as simpler ones. Examples in English speech are ‘Problem solved’, ‘Case closed’, ‘Point taken’, or in Serbian ‘Stigla pošta’, ‘arrived [past participle] mail’; ‘Pala karta’, ‘Fell [past participle] card’, ‘Card played’. Progovac suggests that ‘some languages make predominant or sole use of small clause grammars’ such as Riau Indonesian, Piraha, and Proto-Indo-European’ (ibid., 88). Apart from these root small clauses with no finite verb form, in simpler languages there may be no recursion or embedding, and the interpretation is typically confined to the here-and-now (Progovac 2014:86). We also find a lack of relative pronouns; the repetitive use of conjunctions; no passive voice; no conditionals; a weak tense and mood system; no case markers; very limited use of prepositions; no comparatives or superlatives; no numbers; little in the way of logical quantifiers (some, all, each, every); or little or nothing in the way of intensional verbs – assume, want, think, believe – that might require embedding.

I shall argue that these features of the simple languages are closely related to small homogeneous communities where strangers are relatively few, where there is low division of labour, where technology is of a simple subsistence type, and where there is no literacy or schooling. In other words, where utterances are *heavily context-dependent*. Literacy, on the other hand, is a crucial factor in the development of linguistic complexity, together with social size and cultural differentiation and heterogeneity. If, then we dismiss the belief in a language organ or module our only alternative is to propose a dialectical, constructive relationship between the properties of the human mind and the social relations between the individuals concerned. I therefore agree entirely that

...grammar is the product of history (the processes that shape how languages are passed from one generation to the next) and human psychology (the set of social and cognitive capacities that allow generations to learn a language in the first place). More important, this theory proposes that language recruits brain systems that may not have evolved specifically for that purpose and so is a different idea to Chomsky’s single-gene mutation for recursion’ (Ibbotson & Tomasello 2016: 74).

In order to pursue this line of enquiry we must begin with the acquisition of language in ontogeny. It seems clear that a fundamental and unique characteristic of the human mind that is a necessary condition for language acquisition is what Tomasello has called ‘joint attention’. Joint attentional skills emerge together at around nine to twelve months. Before this point infants

typically interact either with objects or with people, dyadically, without coordination. But at this point

...a new set of behaviors begins to emerge that are not dyadic, like these early behaviours, but are triadic in the sense that they involve a co-ordination of their interactions with objects and people, resulting in a referential triangle of child, adult, and the object or event to which they share attention...Most prototypically, it is at this age that infants for the first time begin to flexibly and reliably look where adults are looking (gaze following), to engage with them in relatively extended bouts of social interaction mediated by an object (joint engagement), to use adults as social reference points (social referencing), and to act on objects the way adults are acting on them (imitative learning) (Tomasello 2000:62).

In particular, it is at this time that children start declaratively pointing to or holding up objects to gain the attention of adults not to themselves but to outside objects. ‘Declaratives are of special importance because they indicate especially clearly that the child does not just want some result to happen, but really desires to share attention with an adult’ (ibid., 63).

On the other hand, by contrast

Chimpanzee gestures are essentially imperative, designed to bring reward or advantage to the gesturer. That is, the chimp is requesting something, rather than making a statement. Studies of the use of signs by chimpanzees and bonobos in their interactions with humans have shown that 96-98 percent of their signs are imperative, with the remaining 2-4 percent serving no apparent function...In marked contrast, human language includes declarative statements as well as imperative ones. We talk in order to share information, rather than merely request something for ourselves (Corballis 2011:163)

(Chimpanzees are also very poor at auditory imitation and not much better at imitating what they see: Hauser, Chomsky & Fitch 2002: 1575). Tomasello has shown that it is the unique qualities of human social interaction that provide an essential basis for the creation of language as a collective representation. Human cultural learning is made possible

...by a single very special form of social cognition, namely, the ability of individual organisms to understand con-specifics as beings *like themselves* who have intentional and mental lives like their own. This understanding enables individuals to imagine themselves “in the mental shoes” of some other person, so that they can learn not just *from* the other but *through* the other. This understanding of others as intentional beings like the self is crucial in human cultural learning because cultural artifacts and social practices – exemplified prototypically by the use of tools and linguistic symbols – invariably point beyond themselves to other outside entities: tools point to the problems they are designed to solve and linguistic symbols point to the communicative situations they are designed to represent. Therefore, to socially learn the conventional use of a tool or a symbol, children must come to understand why, to what outside end the other person is using the tool or symbol, that is to say, they must come to understand the intentional significance of the tool use or symbolic practice – what it is ‘for’, what ‘we’, the users of the this tool or symbol, do with it (Tomasello 2000:5-6).

Again, ‘teaching is a form of altruism, founded on a motive to help, in which individuals donate information to others for their use’ (Tomasello 2009: xiv), and humans actively teach each other things without regard to kinship. Even before speech develops, infants will try to provide information to adult strangers who need it by pointing, but apes do not understand this type of informative pointing at all. They do sometimes point at humans, but only to indicate that they want something for themselves; on the other hand, ‘Confronted with pointing, [human] infants appear to ask themselves “why does *she* think that my attending to that cup will be helpful or relevant to *me*?” ’ (ibid., 18).

Infants also have an innate grasp of rules, in the sense of readily understanding that things *should* be done in a certain way, and try to enforce this. Children therefore legislate norms by themselves, regardless of parental instruction, even when not immediately involved in an activity, so that, observing a solitary game, they will condemn a puppet who is introduced and then disobeys the rules. The notion of the ideal way of how a game ought to be played follows directly from watching an adult, and children don’t need to see the adult corrected. So rules are not just instrumental guides to the children’s own effective action, but ‘are supra-individual entities that carry social force independently of such instrumental considerations’ (ibid., 38).

Pattern-recognition, in which humans are specially adept, is also another crucial aspect of language acquisition, particularly during the sensori-motor stage of development. Evans (2014: 120) summarises these as:

The ability to relate similar objects and events, resulting in the formation of perceptual and conceptual categories for objects and events. Category formation aids recognition of events and objects.

The ability to form sensorimotor schemas based on recurrent perception of action. This is associated with the acquisition of basic sensorimotor skills, and the recognition of actions or events, such as crawling, walking, picking up an object, and so on.

The ability to perform distributional analysis on perceptual and behavioural sequences. This allows infants to identify and recognise recurrent combinations of elements in a sequence and thus identify and recognise sequences.

The ability to create analogies (recognition of similarity) between two or more wholes (including utterances, based on the functional similarity of some of the elements in the wholes.

We have, then, ample evidence for a number of innate dispositions in children that facilitate their acquisition of language: joint attention, social referencing, information sharing, imitative learning, and the grasp of rules, to which should be added skill in pattern recognition

and sufficiency of short-term-memory. Children acquire a good, though not complete, mastery of grammar by around the age of 5 or so, which is well before they can fully grasp concrete operational thought, still less formal operations. This is presumably because, unlike the physical world about which they have to construct their own representations, language is not only presented to children ready-made, but is made by beings with the same minds as the children who are learning it.

The earliest language of our ancestors would presumably have resembled that of children in many respects, and Jackendoff and Wittenberg (2014:68-72) sketch out a plausible model for the early stages of language, which like that of children would have begun as a one-word 'grammar'. But while this could not involve syntax it could be greatly enriched by 'pragmatics' – real life content. In the case of infants' speech, 'For instance, 'doggie' can be used to mean 'there's the doggie', 'where's the doggie', 'that looks like a doggie', 'I want the doggie', 'doggie pay attention to me', and so on...' (ibid., 71) depending on what the situation is.

The next step is a two-word grammar, the number two being significant because this introduces a semantic relation between the words. 'We speculate that this new semantic relation is the real source of complexity in two-word utterances' (ibid., 68n.3) The two word grammar then develops into a 'concatenation grammar' consisting of strings of words of indeterminate length, but still without syntactic categories like nouns and verbs. Simple phrase grammars then follow, in which phrases are distinguished from words in the utterance. '...at this point in the hierarchy it starts to become useful to introduce parts of speech (or syntactic categories) to label words and phrases, yielding a part-of-speech simple phrase grammar. In such a grammar, different categories of phrases may specify different categories and orders for the words they contain...' (ibid., 69). When it becomes possible to group phrases into higher order phrases, recursion finally becomes possible and syntactical structures develop.

But Jackendoff and Wittenberg point out the crucial role in this process of semantics and what they call 'pragmatic enrichment' at the interface between utterance and meaning, which can be applied to much more complex utterances than one-word grammars. 'They invoke only linear order and semantic distinctions such as object vs. action, argument vs. modifier, agent vs. patient, and topic vs. focus. They show how a fairly expressive language could be constituted without syntactic categories and even without phrase structure' (ibid., 77).

This is an appropriate point to review Hockett's claim, mentioned earlier, that 'all languages have about equally complex jobs to do' which is the exact opposite of the truth. In our society language is employed in a vast diversity of ways through the medium of writing: literature, the natural and social sciences, technology, journalism, law, theology, and philosophy, for example, quite apart from all the occasions of its spoken forms both in the news media and face-to-face. On the other hand, in primitive societies there is, of course, no writing, and conversation is focused on the concrete and practical, so that all language is experienced in the context of daily life. In my experience of the Konso and Tauade uses of language, the telling of stories does not involve any apparent changes in syntax from that found in ordinary conversation. There are few strangers, and everyone shares the same general experience, with little specialisation of labour, apart from considerations of gender and age.

There are, in particular, no schools or formal instruction or lectures from adults; on the contrary, children learn practical tasks in the context of daily life by participating in the activities. Gradually the child is inducted into the full life of an adult. He is almost never told what to do in an explicit, verbal, or abstract manner. He is expected to watch, learning by imitation and repetition. Education is concrete and nonverbal, concerned with practical activity, not abstract generalization. There are never lectures on farming, house-building, or weaving. The child spends all his days watching until at some point he is told to join in the activity. If he makes a mistake, he is simply told to try again (Gay and Cole 1967:16; see also Fortes 1938 for detailed confirmation of this).

The general principle at work here is that the richer the contextual information of utterances, the less load needs to be placed on syntactical structures to supply meaning:

Our idea is that the simpler grammars in our hierarchy put more responsibility for comprehension on pragmatics and discourse context. For instance, to understand a child's one-word utterance, one needs to rely heavily on inferences about what the child might have in mind. As the child's grammar acquires more grammatical devices, it provides more resources for making complex thoughts explicit, reducing the workload on the hearer. One could say that the syntactic complexity of a maturing speaker is gradually easing the semantic and pragmatic burden on the hearer (Jackendoff and Wittenberg 2014:66).

6. Some examples of simple languages

To illustrate this extremely important point I shall give some examples from non-literate cultures whose communication was exclusively oral, so that meaning was heavily dependent on real-life contexts. The most celebrated example of a society with a very limited grammar which also lacks recursion is that of the Piraha of the Amazon, as described by Daniel Everett, a professional linguist who originally went there as a missionary. His work has been claimed as a fundamental challenge to Chomsky and initiating a revolution in linguistics, but from what we have seen of developments in linguistics in recent decades, the claims of Universal Grammar, and especially about the central importance of recursion have actually been obsolescent for some time.

The Piraha are a small population of a few hundred hunter-gatherers with a very simple material culture, living in villages on the banks of a tributary of the Amazon, who have been in contact with the Portuguese for more than two hundred years, and with missionaries, but who refuse to become acculturated. Everett describes the occasion when he first realised that the Piraha have no recursion as follows: ‘...one day Kohoi was making a fishing arrow and needed a nail for the tip. He spoke to his son, Paita... : “Hey Paita, bring back some nails. Dan bought those very nails. They are the same” ’ (Everett 2008: 227). Apparently the Piraha language does not have relative clauses that would allow them to say ‘Bring back the nails that Dan bought’ instead. But, despite this limitation in their language, the Piraha can clearly *understand* the idea that has been expressed by the relative clause here; it is simply that they have to use a circumlocution to express it. The Piraha language also has a very limited grammar in other respects, which can be summarised as, besides no recursion or subordinate clauses:

no relative pronouns; only single modifiers; only one possessor; no co-ordinates such as ‘John and Bill came today’; no disjunctions e.g. ‘either Bob or Bill will come’; only one verb and one adjective in a sentence; no comparatives or superlatives; no counting; no distinction between singular and plural; no quantifiers – some, all, every, none; nouns have no prefixes or suffixes; no colour terms; no passive constructions; word order is not strict; no phatic communication (no greetings or farewells, ‘please’ or ‘thank you’ etc.).

Everett maintains, quite rightly, that culture has a powerful influence on language, and claims that many features of Piraha culture and language can be explained by what he calls the Immediacy of Experience Principle (IEP). With regard to Piraha grammar he says:

Embedded sentences rarely, if ever, are used to make assertions. So the IEP predicts that the Piraha will lack embedded sentences because declarative utterances may contain only assertions. (234-5) ‘It predicts that P will lack coordination because this also involves the general property of recursion...’ (236) ‘The IEP’s restriction against recursion also correctly predicts that P will lack disjunction, as in *Either Bob or Bill will come*...because it, like co-ordination, involves putting phrases inside of other phrases – recursion. ‘...the IEP helps to account for the other gaps in the language...such as the absence of numbers and numerals, the absence of color words, the simplicity of the kinship system, and so on’ (237).

The IEP is also claimed to explain why the Piraha have no rituals or myths:

This principle states that formulaic language and actions (rituals) that involve reference to non-witnessed events are avoided. So a ritual where the principle character could not claim to have seen what he or she was enacting was prohibited...the idea behind the principle is that the Pirahas avoid formulaic encoding of values and instead transmit values and information via actions and words that are original in composition with the person acting or speaking [or witnesses or told by a witness]. So traditional oral literature and rituals have no place (ibid., 84).

The IEP is also said to account for the very simple Piraha kinship system. The kinship terms do not extend beyond the lifetime of any given speaker in their scope and are thus in principle witnessable – [eg one’s grandfather can be met, but not one’s great-grandfather].(ibid.,133)

Here I must record my agreement with Sampson in his interview with Everett, when he says ‘I also wonder why it is important to you to derive diverse properties of Piraha from a single, simple abstract principle such as Immediacy of Experience. This feels like the kind of intellectual move that is attractive to the true believers in innate knowledge of language’ (Sampson 2009b: 224). Everett’s ethnography of the Piraha is thin by anthropological standards, but one can make out enough of their social organization and culture to conclude that there are problems with taking the Immediate Experience Principle as some distinctive feature of their culture. By this I mean that if we take into account the comparative literature on hunter-gatherers, and also the findings of cross-cultural developmental psychology the IEP turns out to be a familiar feature of hunter-gatherer culture, albeit developed to an extreme degree, but with which anthropologists are already familiar. Foragers are generally characterized by fluid group organization, individual freedom of movement and group membership, immediate and relatively easy access to resources, immediate consumption, simple division of labour, and relatively direct personal leverage over other individuals (Honigman 1968; Cohen 1985: 99-100). Morris (1991:266-67) also refers to a normative stress on symmetric relations and egalitarianism, both between parents and children and between the sexes; second, a normative stress on self-

sufficiency...third, a general looseness of social ties so that camps are “shapeless, unstructured aggregations” of related kin, there being no corporate groups of any kind.

It has also been observed by various anthropologists (e.g. Gardner 1966, Morris 1976, 1991) that while the members of hunter-gatherer societies unsurprisingly have a great deal of practical knowledge of their environment, not only are their taxonomic systems limited in scope but they have a relative unconcern with systematisation (Morris 1976:544). Gardner refers to this as memorate knowledge, that is, knowledge based on personal, concrete experience, and it has been noted as a characteristic of a wide range of hunter-gatherer societies, as well as some shifting cultivators. It extends to social relations as well as to the natural world, and Gardner for example says of the Paliyans ‘Just as [they] have problems with natural taxonomy, they manifest difficulty providing models or rules to describe social practices such as residence’ (Gardner 1966:398). We can see that all these features apply quite well to the Piraha.

For example, it should be noted that the Piraha mode of classifying kin is about the simplest possible. All we have are a few categories basically referring to generation, and not even confined to actual kin: *baixi* = parent, grandparent, or someone to whom one wishes to express submission, e.g. a Brazilian, or a term of affection for the elderly. *xahaigi* = sibling, male or female, and it can also refer to any Piraha of the same generation. There is also *hoagi* = son, and *kai* = daughter. (ibid., 86). It is not even certain that there are distinct terms for ‘mother’ and ‘father’, but Everett is not very clear on this. The lack of number terms is also a good example of this weak classification, but while the Piraha are an extreme case we noted earlier that many hunter-gatherer cultures and also some shifting cultivators may only have words for single, pair, and many. Again, Everett remarks (ibid., 119) that Piraha lacks logical quantifiers like *all*, *each*, *every*, so that the word one might try to translate as ‘all’ really only means something like ‘large amount’, and so on. But, like so many other features of Piraha culture, this is a typical feature of primitive thought. For us, ‘some’ and ‘all’ are fundamental notions of logic and basic to propositions of inclusion which relate parts to wholes. So ‘all’ denotes the totality of a set A, while ‘some’ denotes ‘A – x’ (where x is greater than 0). In primitive usage, however, we often find that while words are used that ethnographers translate as ‘all’ and ‘some’, ‘all’ does not denote ‘all possible members of set A’, but ‘all those in our experience’ or simply ‘a lot’ (see Hallpike 1979: 181-2). In so far as primitive thought is not usually concerned with working out

the theoretically maximum number of items in a set, it will therefore tend to use ‘all’ in the Piraha sense of ‘very many’

Everett strongly denies that the thought of the Piraha is primitive: ‘There is nothing in what I have written that should be interpreted as making the Pirahas or their language seem intellectually crude. Rather, what should be concluded is that their language fits their culture and their culture fits their needs and their environment’ (in Sampson 2009b: 228). This, however, is an entirely circular type of argument: it is self-evident that the culture and organization of any society that has survived to be studied must be adequate to its ‘needs’, or else all its members would be dead. The Piraha illustrate that it is possible for a society that is strikingly lacking in intellectual resources nevertheless to survive perfectly well. But we are also entitled to compare them with other societies and say that, for example, that a culture with no system of counting at all is less developed than a culture whose members can count up to a thousand. Again, it is particularly remarkable that the Piraha are said to have no myths or similar stories of any kind (ibid., 133) which may be unique in the ethnographic record. They even lack the idea of left and right (ibid., 215-16), which develops in children in modern society by 5 or 6 years of age and often earlier than that. The Piraha also seem remarkably inarticulate, if the following story is any indication:

A man Xopisi had a wife Xaogioso who died alone in childbirth since no one would help her. (We are not told who Xoi is):

“Xoi spoke. Xopisi is not here. Xoi then spoke. Xaogioso is dead. Well, he was called. I called Xoi. The only one. I thus spoke to Xoi. Xaogioso has died, Xaogioso. Xoi did not go to see her on the floating dock. Xaogioso is really dead. Well, I am really fearful. Xoi then spoke. Xitaibigai did not tell about it. He said she did not tell. Xaogioso, do not die! I then spoke. Xaogioso has become dead. She is no longer here. Xoi did not go to see her on the floating dock.” And so on, and so on (ibid., 91-2) .

The reader may well find this as vague, rambling and unintelligible as I do, and I can certainly say that it has no resemblance at all in these respects to any text I was given during my fieldwork, where my informants both in Papua New Guinea and Ethiopia were quite capable of giving coherent accounts of events.

The Konso of Ethiopia with whom I lived from 1965-67 seemed to use no subordinate clauses in the texts they dictated to me, and certainly had no relative pronouns; so, for example,

instead of saying ‘He is a man who tells good stories’ they would say, like us, ‘He is a good story-teller’. Nor did they use indirect speech; there was no disjunction such as ‘either Killano or Sagara will come’; no comparatives or superlatives; and limited use of adjectives and adverbs. They preferred to speak in sequences of short phrases which they could nevertheless use very effectively to convey meaning. For example, one night there was heavy rain, and the men ran out to their fields to make sure that the water was flowing properly in the irrigation channels. I went along with them to observe, and many of them were naked to prevent their cotton shorts getting uselessly wet, and my presence caused them a little embarrassment. Next morning one of them said to me “*Guiada xayti, halketa xanno*”, “day yours night ours”, which would have been meaningless if said out of context, but which was clear enough in these particular circumstances: ‘The day is public space where you can ask about whatever you like, but the night is our private space and we are not happy for you to intrude on it uninvited’.

The following text is a good illustration of how they could tell a story with a minimum of syntactical complexity:

The Bull that had a Calf

I will first translate this into standard English, and then provide the original in the Konso language with a literal translation:

The Lion owned a bull, and the Monkey owned a cow. On one day the Lion would look after both animals, and the next day it was the Monkey’s turn to do this, and so on. The Monkey’s cow gave birth to a calf on the day when it was the Lion’s turn to look after them. The Lion went and said “My bull has had a calf.” The Monkey said “My cow has had the calf. How can a bull give birth?” And the Lion says ‘We will ask the elders of the animals if a bull can give birth’. All the elders gathered except the Hare. They all went and asked him why he was not coming. The Hare replied ‘My *madedda* [a flat stone used in the removal of seeds from raw cotton] is broken, and I am stitching it together.’ ‘But how can a stone be stitched?’ they all asked. ‘And how can a bull give birth?’ the Hare replied. So the Monkey took his calf, and defeated the Lion.

Garma horma irqaba / Keltayta okata irqaba / olini isegini/ guiada taka Garma
 Lion bull has / Monkey cow has / together they take turns/ day one Lion
guiada taka Keltayta/ okata aKeltayta ixayte/ guiada sede Garma okata idawe/
 day one Monkey/ cow of Monkey gave birth/ day this Lion cow herded/

Garma igalle ga geeni 'hormayo ixaye'/ Keltayta igeeni 'okatayo ixayte horma
 Lion went and says 'my bull gave birth/ Monkey says 'my cow gave birth bull
ata ixayni?'/ Garma ga igeeni 'gimayta garaye ingassana ata horma ixaye'/ gimayta
 how gives birth?'/ Lion and says elders among we will ask how bull gave birth/ elders
apinana pisanta ide /Kubalata bata indene/ nama pisa igeeni 'maana den
 of animals all came/ Hare only not came/ person all say 'why coming
ingin?'/ Kubalata igeeni 'madedda imajamde an'ga hedini'/ orra abila igeeni
 is not?'/ Hare says 'madedda has been broken I and am stitching'/ people other say
'ata hedini dagatae?'/ Kubalada igeeni 'horma ata ixayni?'/ semala ori Keltayta
 how you stitch a stone for?'/ Hare says bull how gives birth?'/ so then Monkey
inaya okata iteyete / Garma ipudame//
 (of) cow took / Lion defeated//

This type of story falls into a familiar Konso genre of animal stories used to make some point about life, very like Aesop's Fables, so none of the listeners is going to query the idea of wild animals owning cattle or preparing cotton; it is normal for people to take turns herding stock, and elders' councils are a basic Konso institution, so in this familiar context they can use very simple syntactic structures to convey the story without any need for grammatical recursion. But in the broader sense of course there is *conceptual* recursion, since each sentence has a clear part to play in building up the story as a whole, the point of which is the symbolic relationship of the type A : B :: C : D, as in bull : giving birth :: stone : being stitched.

While the Tauade language of Papua New Guinea had no relative pronouns either, instead they could sometimes use the following type of recursive construction: "I already know the story that Maia told": "*Na Maia tapue tsinat ulo vari*": "I Maia-told-story already know". The standard word order is SOV, whereas in the embedded clause it becomes SVO. But this construction would seem to struggle with more complex embedded clauses: 'I already know that you gave a small pig to Avui': 'I you gave small pig to Avui already know' and I did not encounter it. Generally, however, they avoided recursion and used the same concatenation of short sentences as did Konso speakers. I collected very large numbers of stories and did not find that they included subordinate clauses. There was also very limited use of adjectives and adverbs, there were no comparatives or superlatives, and verb structure was simple. While in

Papua New Guinea from 1970-72 I also gained some experience of Tok Pisin, or Neo-Melanesian as it was known in official circles.

Some linguists consider that a pidgin is not a real language at all, but since pidgins have duality of patterning and discrete infinity they display the basic defining characteristics of language, and it would therefore seem more logical to regard them as very simple languages. After several generations Tok Pisin has become a widely used language of native speakers, a creole, and in 1957 Fr Mihalic compiled a grammar and dictionary which gives us a good picture of the language as it was at that time.

The vocabulary has been mainly taken from English and German, while the syntax is English with considerable Melanesian influence. It has traditionally been spoken by non-literate natives and by Europeans in the practical situations of daily life such as the plantation and the dockside, which provide meaningful contexts that would often not be available in written texts. It is significant, however, that recursion, the allegedly most distinctive trait of language, is actually one of the least developed aspects of Neo-Melanesian:

Neo-Melanesian as spoken by the New Guinean is characterized by simplicity of clause and sentence structure. The native speaker prefers the simple sentence. When he does use a compound sentence it is mostly a juxtaposing of independent clauses rather than a combination of subordinate and independent clauses (Mihalic 1957: 57).

Again, while there are simple personal pronouns, 'There are no real relative pronouns in Neo-Melanesian. Instead, clauses are simply juxtaposed in two general patterns: with or without a connective' (10). 'What in European grammar we refer to as possessive, relative, reflexive, intensive, or distributive pronouns require in Neo-Melanesian either a phrase or a longer circumlocution' (8). Prepositions are also very limited: 'Actually there are only two pure prepositions in Neo-Melanesian, namely *long* and *bilong*' (44). *bilong* can denote possession, *haus bilong mi*, my house, but also purpose or function, *gutpela bilong kaikai*, 'edible'; origin, *sospen bilong graun*, 'an earthenware pot'; or a characteristic, *man bilong toktok*, 'a talkative man'. *long* denotes a less close relationship than *bilong* and can stand for in, on, at, to, from, with, by, about, because, for, and there are also no real equivalents to the definite and indefinite articles. Conjunctions are: *na* for 'and' as well as 'or'; *no* is 'not' or 'or'; *tasol* ('that's all') is 'but', 'however': *mi lukautim, tasol mi no painim*, 'I searched but did not find'. Quantifiers are:

all, *olgera*; some, several, *sampela*; both, two, *tupela*; many, *planti*; none, *no gat sampela*; other, *arakain* ('other kind'); same, *wankain* ('one kind'), each, *wanpela wanpela*. (This is the same as the Konso expression for 'each': *taka taka*, 'one-one'.) Nouns are basically singular, and there is no regular plural form, such as the English suffix *-s*. Pluralisation is either indefinite *ol haus*, houses, or definite *tripela boi*, three boys. Verbs, too, are very simple: 'Verbs have no real tense forms in Neo-Melanesian. Time relation outside of the present is expressed with the help of adverbial modifiers. The future requires *baimbai* ['by-and-by']; completed action, either *bin* or *pinis*, e.g. *mi lukim pinis*, or *mi bin lukim*, I have seen, I saw' (ibid., 29). 'There is no special paradigm or form to express incompleted action in Neo-Melanesian' and speakers use locutions such as *bipo*, [before], 'formerly'. Again, 'There is no real form for the passive voice in Neo-Melanesian', which requires circumlocutions, nor does the verb have inflections for mood. The imperative, therefore, is *yu go nau*, 'go now'; *nogut yu go*, 'Don't go'. 'May', 'might', 'could' 'should' are all *ken* [can], *yu no ken kilim man*, 'You may not kill a person'. There is no conditional verb form, since this would imply the use of subordinate clauses which, as noted, are avoided in Tok Pisin. 'If' clauses and the syntactical complications they produce in the English verb are avoided quite easily: 'If you had been here yesterday, you would probably have seen him' is '*Asde sapos yu stap hia, natink yu lukim em*' 'Yesterday suppose [if] you stop here, probably [I think] you see him' (34).

But since Mihalic wrote his dictionary and grammar Tok Pisin has become considerably more complex especially through its association with literacy in newspapers and the news media, and in politics, and increasingly in the school system, and not only has the lexicon expanded but grammar has predictably become more complicated.

Riau Indonesian is not a pidgin but a colloquial Indonesian used in informal every-day contexts by the population of the Riau region, who number around five million native speakers (Gil 2009a,b). While it has a large lexicon it is basically used for oral communication and its grammar is of exceptional structural simplicity.

As summarised by Jackendoff and Wittenberg (2014: 80), syntactic parts of speech are not distinguished, there are a small number of affixes which are completely unselective in what they are attached to, there is no inflectional morphology, arguments can be freely omitted, the only evidence for constituent structure comes from prosodic phrasing, and the effects expressed

by syntactic subordination in English are achieved by syntactic parataxis plus pragmatic enrichment. For example, conditionals are expressed paratactically, e.g. ‘You shoot a cop, you go to jail’, and word order is generally free. Gil gives as a typical example the sentence: *ayam makan*, ‘chicken eat’, which is extremely vague and simply expresses the idea of ‘something to do with chicken and eating’, but which could mean ‘the chicken is eating’, ‘the chickens that were eaten’, ‘something is eating the chicken’, and so on, depending on the context (Gil 2009a: 23). Much of the structural simplicity may result from the processes of language contact between indigenous Malay and immigrant Minangkabau (Gil 2009b). Although many of its speakers are also familiar with Standard Indonesian which has a grammar of similar complexity to many European languages, nevertheless:

One important domain in which the standard language is typically preferred is that of writing. However, it is striking that although most Indonesians nowadays can read and write, Indonesia remains a functionally illiterate society: people prefer to communicate orally rather than in writing (Gil 2009b: 30), in all walks of life.

As we shall see, writing is a key factor in grammatical complexity. Finally, we also find many aspects of this simplified grammar among the uneducated of our own society, although Pinker disputes this: ‘Linguists repeatedly run up against the myth that working-class people and the less educated members of the middle class speak a simpler or coarser language’ (Pinker 2015:26). But Bernstein provides copious evidence that this is not a myth at all, and that the speech of the uneducated working class tends to have the following characteristics:

Short grammatically simple sentences; a preference for the active voice instead of the passive; a simple verb structure that limits the expression of process; simple and repetitive use of conjunctions; short commands and questions; infrequent use of impersonal pronouns as subjects [e.g. ‘one’] reliance on implicit meanings and idiosyncratic phrases; repetitious dialogue reinforcing affective elements in relationships and discouraging analysis; conjunctions not used as important logical distributors of meaning and sequence; rigid and limited use of adjectives and adverbs which restricts the qualification of objects and modifications of process (Bernstein 1971).

This is a small sample of the evidence that it is perfectly possible to have simple, sometimes very simple languages that function as an effective means of communication in an oral culture, and that this is even possible in large-scale societies like our own where there are major differences in educational levels and cultural opportunities.

7. Social factors responsible for grammatical complexity.

If grammatical simplicity is associated with relatively small-scale, context-rich societies where information does not need to be precise etc, what are the main factors that produce grammatical complexity? I shall argue that the primary factors that remove context from communication are not just social size and division of labour, and differentiation of life experience in general, but writing which not only allows communication that is no longer face-to-face, as is necessarily the case with oral communication, but which also has properties of its own that favour grammatical complexity: 'Written discourse develops more elaborate and fixed grammar than oral discourse does because to provide meaning it is more dependent simply upon linguistic structure, since it lacks the normal full existential contexts which surround oral discourse and help determine meaning in oral discourse somewhat independently of grammar. (Ong 1982: 38) It also eases the burden on the short-term memory of the writer, so that he can constantly check on how he is constructing a long sentence.

In the case of written utterances, 'Without precise knowledge of the audience or immediate, simultaneous feedback from the audience...the writer is obliged to use words and syntax more accurately, deliberately, and elaborately. In conversation, the participants function as an immediate, concrete environment for one another' (Fondacaro and Higgins 1985:86).

Chafe points out that spoken utterances occur in a series of spurts, which he calls 'idea units'. These are essentially clauses, 'containing one verb phrase along with whatever noun phrases, prepositional phrases, adverbs, and so on are appropriate, and...is about seven words long and takes about two seconds to produce...It is rewarding to hypothesize that an idea unit contains all the information a speaker can handle in a single focus of consciousness' (Chafe 1985:106). That is, the idea unit approaches the capacity of short-term-memory. In longer spoken utterances, 'idea units are typically strung together in a chain, with a relatively small amount of subordination. The complex arrangements of clauses characteristic of written language are rarely exploited. Speakers do not have the time or mental resources to compose them. Idea units may be independent...or they may be linked by co-ordinating conjunctions, by far the most common of which is *and*' (ibid., 111). Written language, on the other hand, not only has longer idea units, 'but places them in various relations of dependence' (ibid., 112). Examples of these relations of dependence are a variety of subordinate clauses, prepositional phrases, indirect questions and

quotations, nominalizations converting verbs into noun phrases, and participles converting verbs into attributive adjectives (ibid., 108-110).

Finite clause subordination is the prime example of a complex feature of language, and there is actually very good evidence that this has evolved in the course of history. Referring to Deutscher's *Syntactic Change in Akkadian* (2000) Geoffrey Sampson observes:

Akkadian is one of the earliest languages to have been reduced to writing, and Deutscher claims that if one looks at the earliest recorded stages of Akkadian one finds a complete absence of finite complement clauses. What's more, this is not just a matter of the surviving records happening not to include examples of recursive structures that did exist in speech; Deutscher shows that if we inspect the 2,000-year history of Akkadian, we see complement clauses gradually developing out of simpler, non-recursive structures which did exist in the early records. And Deutscher argues that this development was visibly a response to new communicative needs arising in Babylonian society (Sampson 2009a: 11).

Karlsson rightly states that typical everyday spoken language tends to be very brief and simple, and

Before the advent of writing in the third millennium BC, the major expository genre was oral narrative, which has been shown to be aggregative and paratactic rather than subordinating. Phrases are strung together into loosely conjoined shallow sequences (Lord 1960). This pattern of ancient additive structure is found across the world. As a case in point, Leino (1975) analysed a section of the *Kalevala* (402 lines of verse, some 1,300 words) and found only three subordinate clauses, all "when"-clauses embedded at depth 1 immediately below the main clause. For comparison, 1,300 words of current written Finnish would typically contain some sixty finite subordinate clauses...(Karlsson 2009:195)

While he agrees that some pre-literate languages do make limited use of finite subordinate clauses,

...there is ample evidence, for example from Semitic, Indo-European, and Finno-Ugric languages that the emergence of more elaborate grammaticalized patterns of finite clausal subordination is related to the advent of written language, especially to the conventionalization of various written registers. Proof of this development is provided for instance by Deutscher (2000) for Akkadian, by W.P. Lehmann (1974) for subordinate clauses in Vedic, by O'Neil (1976) for subordinate clauses in Old English, by M. Harris (1988) for concessive clauses in English and Romance, and by König and van der Auwera (1988) for subordinate clauses in Dutch and German (ibid., 195-96).

Kalmar refers to studies showing lack of subordinate clauses in Australian languages, hunter-gatherers in Siberia, the Bushmen of South Africa, the Ojibway of North America, and Benveniste's claim that proto-Indo-European did not have relative clauses. (Kalmar 1985:158-

59) He also describes in some detail the emergence of subordinate clauses in Inuktitut in response to the use of writing and familiarity with English (ibid., 159-64).

So, to sum up, the linguist F.N. Akinnaso gives the following characteristics of *written* as distinct from spoken language:

1. Preferential usage of elaborate syntactic and semantic structures, especially nominal constructions (noun groups, noun phrases, nominalizations, relative clauses, etc.) and complex verb structures.
2. Preference for subordinate rather than co-ordinate constructions
3. Preferential usage of subject-predicate constructions instead of reference-proposition
4. Preferential usage of declaratives and subjunctives rather than imperatives, interrogatives, and exclamations
5. Preferential usage of passive rather than active verb voice
6. Preferential usage of definite articles rather than demonstrative modifiers and deictic terms
7. Higher frequency of certain grammatical features, e.g. gerunds, participles, attributive adjectives, modal and perfective auxiliaries, etc.
8. The need to produce complete information or idea units and make all assumptions explicit
9. Reliance on a more deliberate method of organizing ideas, using such expository concepts as 'thesis', 'topic sentence', and 'supporting evidence' (1982:104, quoted in Goody 1987:263-64)

According to Karlsson, the maximum number of levels for Initial clausal embedding is 2, for Central clauses is 3, and for Final clauses is 5. These maxima were reached by Akkadian, which then influenced Greek, which in turn influenced Latin (Karlsson 2009 201-202) which then influenced the European languages. These in turn have been extremely powerful models for non-European cultures, especially through colonisation and more recently the United Nations, for the official languages of other governments throughout the world.

And then, once this new language had been invented, generative linguists would come along and point to it as yet further corroboration of the idea that human beings share innate cognitive machinery which imposes a common structure on all natural languages.....I believe essentially that process has been happening a lot with Third World languages in modern times (Sampson 2009a:17)

It might seem rather obvious to most of us that writing would have an important effect on grammatical complexity, but 'Earlier linguists had resisted the idea of the distinctiveness of spoken and written languages. Despite his new insights into orality, or perhaps because of them, Saussure takes the view that writing simply re-presents spoken language in visible form...as do Edward Sapir, C.Hockett and Leonard Bloomfield' (Ong 1982:17) UG makes the whole question of writing and literacy irrelevant in principle, so it is not surprising that Pinker in *The Language Instinct*

does not mention it at all, but it is significant that the topic is almost as generally ignored in most of the other works on linguistics that I have consulted.

With writing comes schooling, which has further potential for grammatical development if it goes beyond mere rote learning. Schooling and formal education that involve taking the pupils out of the context of their normal daily lives and their active participation and discussion with their teachers is of particular importance. It is closely involved with the ability to explain verbally one's reasons for making particular choices in test situations, and it also seems to develop the search for rules for the solution of problems, and the awareness of one's own mental operations. But we should also remember that medieval European universities conducted philosophical and theological debates in Latin, and that disputation was a fundamental basis of ancient philosophy in Greece, India, and China. One is not saying, therefore, that verbal discourse *cannot* engage a high level of syntactic complexity, only that it requires special circumstances, including people who are already literate, to do so. Bernstein found that there were marked differences in schooling between users of the 'restricted' and the 'elaborated code':

...the group whom Bernstein found using this [restricted] code were messenger boys with no grammar school education. Their expression has a formula-like quality and strings thoughts together not in careful subordination but 'like beads on a frame' (Bernstein 1974 p.134) – recognizably the formulaic and aggregative mode of oral culture. The elaborated code is one which is formed with the necessary aid of writing, and, for full elaboration, of print. The group Bernstein found using this code were from the six major public schools that provide the most intensive education in reading and writing in Britain (Ong 1982: 83)

It is an axiom of UG that all native speakers have equal competence in their language, so The fact that native speakers vary in grammatical competence has deep implications for linguistics and related disciplines...I suggest that many linguists have an ideological objection to native speaker variations in grammatical competence, which they regard as socially dangerous, in that they can be used to justify social discrimination based on class and race. I also suggest that generative grammarians have a theoretical objection to individual differences. They are committed to the notion of an innate universal grammar, and individual differences are fundamentally incompatible with this notion (Chipere 2009: 190-91).

So once a written literature has developed in the context of high civilization it has a number of important consequences for thinking and consequently for the use of language. Michael Barnes lists a more critical attitude to tradition because literacy allows the documentation of the past; a greater awareness of language as a tool of thought and the expression of ideas; the promotion of more complex systems of classification and their organization into coherent systems; and the greater privatization of thought and the

objectification of personal experience (Barnes 2000:82-3). Halverson refers in general to ‘the preservative potential of writing’ and its cognitive consequences:

... the amount of available information can increase far beyond the carrying capacity of human memory, individual or collective; it means that each generation of thinkers can therefore build on the work of its forebears without starting all over again, thus making possible a much more rapid advancement of knowledge than is possible under oral conditions; it means that thought can be communicated more easily and accurately over space as well as time; that it can provide intellectual stimulation beyond the possibilities of isolated oral societies; that it can, in short, expand the mind and sharpen intelligence. These are the kinds of possibilities – only possibilities – opened up by writing, all of them probable and rather obvious (1992:315-16).

The complex societies in which the written word becomes normal therefore develop a whole range of cultural subjects that require increasingly complex forms of thought: administrative documents, legislation, legal disputes and arguments, technical manuals for a variety of tasks, and more abstract interests such as the theory of government and philosophy, the natural sciences, and of course literature.

More generally, in modern literate languages such as English, often read from the newspapers or in novels, it requires far more elaborate syntactical structures than are needed in primitive societies in order to provide enough context of time, place, and social circumstances to make statements comprehensible. And in our society most people we meet are strangers with very different life experiences, especially due to the enormous division of labour in advanced industrialized societies.

We can also expect the expression of *more abstract thought* to require greater precision of language than is necessary for the communication of concrete ideas. For example, ‘skid – crash – hospital’ conveys a perfectly comprehensible sequence of concrete events with no syntactical assistance at all, because we can easily visualise the circumstances referred to. But when we are trying to convey abstract ideas we have to supply the necessary conceptual context as we go along, and this requires very precise syntactical tools to make each sentence comprehensible. Such sentences often become extremely long and complex in order to integrate a number of ideas into an intelligible whole. For example:

Thus in spite of the important respects in which Aristotle’s use of opposites resembles, and indeed is influenced by, earlier notions, his physical doctrine of hot, cold, dry and wet may and should be distinguished both from the hypotheses of modern scientific method and also from the vague accounts common in pre-philosophical myths and early philosophical cosmologies: for if this doctrine cannot be

said to give rise to predictions which can be tested experimentally, it is, on the other hand, far removed from the myth that derives all things from Sky and Earth or from symbolic classifications of phenomena which deal globally with the entire spectrum of reality (G.E.R.Lloyd *Polarity and Analogy* 1966, p.85)

Finally, it should be noted in relation to the notion of a genetically based language instinct that writing involves different brain functions and areas from those of speech:

...different brain areas are involved in hearing speech and reading it, and different comprehension centers in hearing words and reading them...This finding refutes the conventional theory of comprehension, which argues that a single center in the brain understands words, and it doesn't really matter how (by what sense or medium) information enters the brain, because it will be processed in the same way and place (Doidge 2008: 308).

Writing, however, and especially *literacy*, is a very recent historical development, and the differences in brain functioning that it produces scarcely seem consistent with the idea of a hard-wired cognitive organ of language.

8. Conclusions

The purpose of this paper has been to assemble some evidence and arguments that language does indeed become more complex in relation to social and cultural complexity, especially as a result of writing and literacy, and cannot therefore be an instinct, organ or module as Universal Grammar maintains. But from the beginning we have encountered not just reason and evidence but the dominating influence of a number of ideologies. By 'ideology' here I mean opinions that are held with complete devotion by True Believers and a determination to reject or evade what non-believers would consider to be important contrary evidence. Skinnerian Behaviourism, for example, had immense academic influence and claimed that the whole idea of the mind was an illusion and that language did not convey thoughts but simply consisted of stimuli that changed the hearers' behaviour. On the other hand Chomsky and his school firmly believe that the brain is essentially like a machine, of which language is an inherited component and whose operation is specified by the genome, and has essentially nothing to do with culture or social relations.

Daniel Everett, in an interview with Geoffrey Sampson (2009b:215) is obviously deeply committed to cultural relativism: 'The Piraha's culturally constrained epistemology can only be evaluated in terms of the results that it gives the Pirahas relative to their own values. Since it serves them very well, there is no sense in the idea that it is inferior.' We might choose to avoid

terms like ‘inferior’ as vague and tendentious, but it is entirely valid to compare Piraha culture with that of other societies, and in this more general scheme of things it appears to be unusually primitive, and the fact that the Piraha themselves appear quite happy has nothing to do with the matter. (Remarkably, in his book (2008: 272) Everett also says that he no longer believes in truth, a strange position for one who has spent a great deal of time and effort trying to prove that Universal Grammar is false, or who wishes his work to be taken seriously at all.)

We have also noted that linguistics has been significantly distorted not only by a dogmatic refusal for many years even to consider the subject of linguistic evolution, but by the obsession of secular liberal academics with intellectual equality, displayed in particular by linguists and cultural anthropologists. The Christian view is that all human beings have moral dignity because we are all children of God, a relationship which renders *intellectual* equality fairly irrelevant. (God, indeed, has generally been regarded as favouring the simple over the learned.) Secular liberals, however, dismiss the idea of God as superstition and believe that we are just another animal species in a Darwinian world, distinguished from other animals in the struggle for survival only by our intelligence. Nevertheless they still want to cling on to the traditional Western belief in the brotherhood of Man, and they can only do this by a fanatical conviction about human intellectual equality, despite all the evidence to the contrary. Liberal academics, especially during the Cold War, were also accustomed to look down on their colleagues in the Soviet Union, whom they saw as slaves to Marxist ideology. Yet at the same time, of their own free will and without the excuse of secret police, gulags, and firing-squads they eagerly enchained themselves in liberal political dogma about human intellectual equality that is just as devoid of evidence as Lysenko’s dismissal of genetics as bourgeois science.

Notes

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1. Indeed, the unfortunate Professor Everett, celebrated for claiming that the Piraha have no grammatical recursion, has been denounced as a racist for implying that they are therefore subhuman, and denied permission to return to them (Bartlett 2012:5).

2. It is interesting that, since descriptive linguistics in America was fundamentally concerned with field studies of the languages of the Native Peoples, the doctrine of equal complexity was not questioned at that time. But ‘When relative complexity was previously a live issue in linguistics early in the twentieth century, syntax was not specially central to the discussions’ (Sampson et al. 2009: 270) which were more concerned with comparative phonology.
3. I am obliged to Prof. Dr. Georg Oesterdiekhoff for drawing my attention to this in an unpublished paper he was kind enough to send me.
4. Rather similar ‘parameters’ go back at least to the universals of Greenberg (1966).
5. Tomasello claims that ‘...the ontogenetic process that Piaget hypothesized as crucial for infants’ understanding of objects in space – namely, the manual manipulation of objects – cannot be a crucial ingredient since infants understand objects in space before they have manipulated them manually...This ruling out of one potential developmental process is a significant scientific discovery’ (Tomasello 2001: 50). It is a pity that Tomasello had not read Lourenço & Machado 1996:144, which conclusively refutes the infant studies cited by Tomasello.
6. Professor Colarusso has pointed out (personal communication) that languages with small phonological inventories, such as Polynesian, must have long words and so would find it difficult to utilize embeddings, whereas at the other extreme languages such as Ubykh, with 81 consonants, can pack more in and so put less strain on working memory and therefore open the door to embeddings. So it is possible that phonology can have developmental consequences, although these seem to arise only in extreme cases of simplicity or complexity,

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