

# The language faculty: following the evidence

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The language faculty is, simply put, all of the neural and biological mechanisms involved in the uniquely human ability to do language. Some consider it a biological endowment, that it is a gift from our Creator, and that it is here by design, hard-wired into our brains. Others believe that it evolved purely by chance through the accumulation of accidental mutations over millions of years. The implications of these two mutually exclusive viewpoints are immense and sweeping. Both basic positions can appear far-fetched and fanciful when followed to their logical conclusions, and both involve comprehensive belief systems in order to account for the amazing complexity and diversity of human language(s). This paper looks at some of the empirical evidence in order to separate observable fact from speculation, and to understand what the current state of our knowledge suggests about its origins. Much is at stake.

## The evolution of language

Over the years, attempts to link language and biological evolution have encountered a number of challenges. From the historical perspective, specialists have estimated that one very important language, Proto-Indo-European (PIE), a theoretical reconstruction of what may have been the original ancestor or progenitor of the Indo-European family of languages, was spoken about 4,500–6,500 years ago according to evolutionists—not a terribly long time into the past. The fact that modern languages seem to have *devolved* from their relatively ancient predecessors caused considerable consternation among early historical linguists who had earnestly sought to establish a logical progression in their development, from simple to increasingly complex forms and structures. August Schleicher (*circa* 1870) argued that languages were independent organisms with lives of their own that underwent a period of development (evolutionary progress) followed by one of decay, indicating the ebb and flow of evolution. However, the evidence shows language evolution as mostly a process of decay.<sup>1,2</sup> Faced with overwhelming evidence that extant languages have undergone a process of degeneration from their progenitors (e.g. gradual morphological simplification and consequent loss of syntactic variation of old Anglo-Saxon into present varieties of English), most linguists had abandoned theories that languages naturally evolve by the middle to late parts of the nineteenth century.

The topic itself invites a great deal of speculation. If language is indeed unique to humans, it seems reasonable to ask: where has it come from? Awards have been given for the best answers. Divine origin, evolutionary development, even language as a human invention have all been proposed. Frustration is the suspected outcome, particularly because of the obvious conflict between actual written evidence and the popular assumptions of humankind's origins in a very remote past.

‘For these reasons, scholars in the latter part of the nineteenth century, who were only interested in “hard science”, ridiculed, ignored

and even banned discussions of language origin. In 1886, the Linguistic Society of Paris passed a resolution “outlawing” any papers concerned with the subject.’<sup>3</sup>

This was due to the pure speculative nature of the arguments. Nevertheless, it is not merely a matter of demonstrating the evolution of language and/or evolution of the human faculty of language; the task is to account for the simultaneous evolution of both. The fact is, they are both part of our intrinsic nature as human beings.

There seems to be a great deal of renewed interest, spurred on by the recent work of such linguists as Derek Bickerton,<sup>4</sup> Steven Pinker<sup>5</sup> and more recently, the much publicized ‘conversation’ in the journal *Cognition* between two groups of prominent linguists with differing evolutionary views, one adaptive or adaptationist<sup>6</sup> and one not.<sup>7</sup> The discussion, however, is typically positioned within a particular context, evolutionary theory, in which evolution is presumed to be true and its validity unimpeachable—the philosophical points made are construed as support for a particular view of the mechanisms of evolution. The discussion itself also finds renewed respect and credibility due to its association with respected members of the scientific community. If an evolutionary account appears weak or fails, divine origin does not necessarily become convincing by default. In fact, in an evolutionary scenario, divine origin is ruled out from the beginning.

## Language and species: two different products, two different processes

Referring to the proposed links between human language and animal species that are woven into evolutionary theories, Bickerton, in his volume *Language & Species*, notes the troublesome ‘continuity paradox’, that there does not seem to be a way to get from animal communication to human language in evolutionary steps.<sup>8</sup> He also comments:

‘... the only aspect of Darwin’s ideas on language that interested Darwin’s contemporaries was his comparison of the evolution of species with

the evolution of languages—a connection between “language and species” that will emphatically not be pursued in these pages!”<sup>9</sup>

There is the rather obvious problem of connecting the two, (a) language and its presumed connection with culture, and (b) human evolution, one that can infer its way into the kind of social Darwinism which characterised the racist beliefs of the Nazis in Germany in the early to middle parts of the twentieth century—that is, if one assumes the superiority of one group of humans over another on the basis of language or race. If one assumes that all human beings are fundamentally ‘equal’ in development (with individual variation), then, by definition, one race or social group is not more or less evolved than any other.

Seemingly ignoring the speculative nature of this line of inquiry, some linguists have recently proposed, according to conservative estimates, that the origin of human language took place approximately 35,000 years before the present (or BP), corresponding to the time that *Homo sapiens* is believed to have begun its great migrations into various regions of the globe. A consensus appears to be more at 100,000 years before the present, when *Homo sapiens* allegedly first appeared, with the time frame espoused by some anthropologists reaching from one to five or six million years. These estimates are made despite the fact that the earliest written records, the writings of the Sumerians, accounts of civilization as we know it, date back only to around 3200 BCE according to evolutionists, obviously very recent history.<sup>10</sup> One can’t help but wonder what could have occurred between 5,000 and 5,500 years ago that would trigger such a significant development. Indeed, it is curious how writing could have suddenly emerged after 30 to 100 millennia of speech. And, if writing had been in existence prior to that of the Sumerians, where is the evidence?

A number of very tough questions follow as a consequence: is written language (the ability to read and write a human language) a product of evolution or of humankind’s native intelligence? Are the languages spoken today which have no writing systems (there are many) less developed than their literate counterparts? Are the brains of non-literate speakers less evolved than those who possess a written language? The answer is an unequivocal ‘No’! The concept of literacy is problematic in itself. It is a notoriously difficult concept to define. It requires a written language (or writing system), some form of instruction, and a body of literature. Those who hold to the so-called literacy myth suggest that the possession of literacy leads to the possibility of ‘higher-order’ thinking.<sup>11</sup> Clearly, critical literacy (the ability to read texts critically and understand their historical and social contexts) has necessary links to a host of educational and socioeconomic factors that have nothing to do with native intelligence or linguistic ability. It depends a great deal on such external factors as culture, educational opportunity and the like.

With respect to the future, there doesn’t seem to be a logical reason to assume that humankind has somehow become immune to evolutionary processes, that we have reached some kind of impassable plateau, and more

‘developed’ forms cannot appear. Apparently, if we hold to evolutionary processes, we need to remain open to the idea of the continuing development of humankind’s cognitive abilities, and that one group may emerge as superior or more advanced in some physical or mental way. We can only hope that a form of social Darwinism will not again grip our species and that one group of humans will not assert its superiority on the basis of its perceived fitness to dominate.

### Ape language studies

There have been a number of interesting attempts at establishing links between the language faculty and evolutionary principles. Looking for homologues with respect to the structures of basic articulators (the parts of the human body used in speech, apart from the brain) has proved to be troublesome, e.g. regarding the positioning of the larynx. Examining communicative behaviours has yielded similarly meagre results; no continuity has been found at all between ape communication and human language. It is true that certain parrots can mimic human speech sounds, but no one would call that ‘language’. Looking to our closest genetic relatives (those with the closest resemblances in DNA), the great apes became the likely candidates for the investigation of the potential for language. Once again, the results have not been promising, specifically for demonstrating continuity between human language, in all cases incredibly complex yet systematic, and animal (i.e. non-human) communication.

Various studies on animal communication have been conducted, and many have even appeared on public television, although their numbers have dropped off significantly in recent years (perhaps to zero). These studies—perhaps the most famous of which were done with a gorilla, Koko, and two different chimpanzees, Washoe and Nim Chimpsky—focused on attempts to teach apes some sort of sign language. To be fair, current work with the bonobo Kanzi by Savage-Rumbaugh and her colleagues<sup>12</sup> differs in significant ways from the earlier studies—more on that below. The reasoning behind these initial attempts was twofold. (1) Chimp DNA is as close to human DNA as it apparently gets, and if the language capacity is encoded into our DNA, maybe it is there in the chimp’s in some form or degree. (2) The great apes may not be able to vocalize language, but they seem to demonstrate the manual dexterity necessary for signing. So, maybe they have some innate linguistic ability even though they don’t have the ability to speak.

The first attempts were intriguing and caught the eye of the academic community. There is no question that these animals are intelligent, and that they are able to communicate in some ways among themselves in the wild and across species to humans. The disappointment lay in the realization that what they are capable of learning is not language in the human sense. Taking the well-known example of Nim Chimpsky, what was revealed by the chimp’s behaviour illustrates both the quantitative and



As clever as they are, gorillas do not have language.

qualitative aspects of language. Raised from birth by human caregivers, Nim learned about 125 signs (compared to the estimated 75,000-word lexicon of an Oxford undergrad)—which is a very real accomplishment for any animal. But, his signing fell short in more than a quantitative measure. Qualitatively, only 12% of his utterances were spontaneous; the rest occurred in response to prompting or when he wanted something (food, drink or attention). As much as 40% of his utterances were simple imitations of the signs of his trainer, more an indication of conditioned behaviour than evidence of a biological endowment. In contrast, all human children initiate conversations and are creative with language almost from the beginning, the onset of language; all characteristics that Nim failed to exhibit.<sup>13,14</sup>

### **Denial of the obvious?**

According to Seidenberg, a critic of past ape language research, ‘At first glance, studies of ape language seem to be premised on denial of the obvious. Humans acquire and use natural languages, and lower primates do not.’<sup>15</sup> This irrefutable fact would seem to constrain *a priori* what might be learned by training apes to perform ‘linguistically’. It was hoped that these projects would provide information about the behaviour of other intelligent species, contrasts

between humans and other species, the origins and evolution of human language, and relationships between linguistic and nonlinguistic intelligence. The stakes were high. However, Seidenberg notes a logical inconsistency.

‘Evolution provides no basis on which to anticipate particular behavioral similarities, in terms of language or otherwise. Evolution is a theory of speciation, not of behavioral continuity ... As a consequence, comparisons of behavior need to be interpreted in the context of a theory of behavioral similarity, not merely in terms of evolution ... This point has not been sufficiently appreciated in the ape language literature. The problem is that general evolutionary facts are sometimes used in order to establish behavioral similarities ... The apes exhibit complex behaviors that are ambiguous at best. The interpretation of these behaviors is assisted by appeals to evolution, leading to the conclusion that an ape’s behavior corresponds to that of a human because apes and humans descended from a common ancestor. However, this reasoning is entirely circular. In the absence of an explicit theory as to how particular behaviors evolved, evolutionary facts such as common ancestry provide no basis on which to mediate comparisons of behavior.’<sup>16</sup>

In other words, biological evolution applies to physical characteristics and not to behavioural characteristics. And, even though the apes demonstrated complex behaviours, making an appeal to evolution to explain apparent similarities is not adequate. Ape behaviours can be interpreted in a number of different ways, and apparently, none of the explanations proved conclusively that the apes showed true linguistic abilities. The circularity involves presupposing biological evolution, and then interpreting any and all behavioural similarities as evidence of that evolution. One needs also a theory (perhaps Darwinian) that can explain the evolution and development of behaviours. After all, apes have existed quite happily (I assume) without language. We still need a rational hypothesis for what could have driven the *simultaneous* development of language and the mental capacity for language.

Seidenberg also points out that chimps may be thought less highly developed than humans.<sup>15</sup> However, if we take the position that chimpanzees and humans have evolved from a common ancestor, they are equally evolved along the evolutionary continuum, ‘they simply evolved in a different manner’. All attempts to infer anything from the behaviour of chimpanzees to that of a common ancestor that may have existed millions of years ago are speculative at best.

### **Two early research strategies**

Nevertheless, the research was looked on as possibly contributing to the knowledge of our species and to our origins. The researchers generally had a couple of strategies for finding the information they wanted in their study of apes. The first (which is still taking place in current studies) was to identify the natural communicative behaviours of lower primates that may share important properties with



human language. Despite the fact that the natural behaviours of apes showed interesting characteristics, it was not very likely that lower primates would be shown to exhibit a natural system of communication that would resemble human language to any significant degree.

The second strategy was to train apes—and here, the operative word is train. Chomskyans (Generativists) seem to demonstrate that children do not learn language in any kind of behaviourist sense (i.e. according to the views of B.F. Skinner). Therefore, in the complete absence of the apes learning/acquiring linguistic skills/language in the wild, it was clear that they needed a little help. Maybe they had linguistic capacities (as a result of the similarities of DNA structure, etc.), but they just never had the opportunity to acquire linguistic skills—it isn't their fault that language isn't in their environment. Maybe their full capacities cannot be developed in a jungle. Also, if it could be proved that apes could learn language, this would have the effect of refuting Generativist's claims that language is acquired naturally through observation, or that it is species specific and a biological endowment. This would also reinforce the behaviourist views of Skinner and others that prevailed in language teaching before the advent of Chomskyan linguistics. 'Construed in this manner, the ape language experiments could only provide a test of how much linguistic behaviour could be acquired through application of the precepts of *Verbal Behavior* [the well-known book by Skinner]' according to strict behaviourist principles and not what an ape is capable of doing in a natural environment.<sup>17</sup>

Consequently, child language acquisition studies and the studies of ape behaviours have had very different goals, backgrounds, and contexts. What every human child does naturally, unconsciously and without prompting was being compared to what primates might be able to accomplish with intensive training. In a kind of wishful thinking, the hope seemed to be that apes might have the capacity to produce or comprehend at least some kind of linguistic communication, but this capacity remains unexpressed in a natural environment. Perhaps laboratory conditions can provide a way of realizing this capacity, and maybe part of the problem is that apes only lack the articulatory mechanisms to produce speech.

'This logic is inconsistent, however. Apes lack part of the neuro and motor-physiology that support speech. The sign language researchers proposed to overcome this limitation by exploiting the apes' natural ability to gesture. This effort would only succeed if they were capable of using the alternate modality. But if apes possess this capacity, the explanation for the fact that they fail to naturally express their linguistic capacity is wholly lost.'<sup>17</sup>

The ape studies would never be able to explain why apes don't express any sort of linguistic abilities on their own. They would only show that apes had somehow unexpressed linguistic abilities, that is, but only if they succeeded in



The bonobo's abilities seem closer to that of humans, but the gap is still formidable, with no evidence of continuity.

using a manual system in ways that approximated human language—which they have completely failed to do.

#### **Improved methodology: Kanzi**

The researchers responsible for the ongoing work with Kanzi have consciously eliminated the behaviourist approach—there has been no intense training (though there has been the requisite testing). Kanzi and his cohorts (family members) have been allowed to interact freely with human caregivers almost from the start, and the results have been very interesting regarding the abilities of bonobos (formerly referred to as pygmy chimps). Their task was to press so-called lexigrams, abstract symbols on a computer keyboard. The approach, as with many scientific discoveries, was found almost accidentally, as a young Kanzi began to interact with the humans spontaneously while they were working with another bonobo. After noticing how quickly Kanzi seemed to learn to use the lexigrams, the researchers shifted their focus to what he could acquire without training, which appeared to be significantly more than other great apes could acquire with training. They surrounded him with a 'culture' of human speech that included the natural communicative interaction of humans and bonobos (*Pan paniscus*), a pan-homo environment of shared experience and behaviours, giving their interactions a natural context, and, therefore, increased meaning.

From the perspective of a linguist, this work also fails to demonstrate linguistic continuity between bonobos and humans. The definition of language, in this case 'primal language', was broadened to include the types of communication that animals are quite capable of, and consciously to eliminate the connection of human language with grammar (namely syntax). Yes, it is very interesting that bonobos appear to be able to recognize spoken words, but it was not demonstrated that they understand spoken language as humans do, especially the kind of awareness humans have to individual sounds (phonemes) and often very subtle phonological processes. We learn much about the natural abilities of bonobos. However, the definition of language was broadened to such an extent that the truly extraordinary nature of human language is effectively lost. We can add this to the logical problem of linking behaviours with physical characteristics according to an evolutionary model. The researchers have succeeded more in drawing attention to the essential differences and underscoring them than they have in establishing analogues and homologues.

Despite the care that these researchers have taken, they have found the same limitations as the earlier studies. It appears that apes (in fact, all other species) lack the same capacity for computation or grammar that every single human being expresses. For instance, even in imitative behaviour, the clever apes simply cannot copy a *series of behaviours* beyond a very limited set. They don't seem able to store complex patterns of behaviour in their ape brains. If specific behaviours are presented A + B, then apes can replicate ABAB patterns. However, if the pattern is AABBA, then imitation stops. Apes are not capable of AABBAABB (and so on) patterns, which require perceiving, remembering and then performing more complex sequences.<sup>18</sup> The same applies to monkeys and their ability to distinguish complex sound patterns; they can successfully discriminate syllabic patterns of AB but cannot discriminate more complex patterns of AABB, AAABBB, etc.<sup>19</sup> They simply lack the cognitive capacity for syntax, something that every child exhibits during the second or third year. Moreover, if they were indeed able to use different modes of linguistic communication (manually instead of vocally), as non-hearing children do, then what can inhibit this expression besides the absence of linguistic ability? 'It is interesting to note in this regard that the natural communication of lower primates is not primarily gestural. On their own, they seem to make little of their opportunity to use their hands for communication.'<sup>17</sup> They may exhibit genetically-based calls and screeches, but they don't show the capacity for human language.

### What the apes seemed to learn

It seems simple enough to see what the apes did not learn, but what *did* they truly learn? They learned tasks that they could perform (the instrumental function of signing) in a lab context. These tasks were in essence non-linguistic in nature because the specific behaviours (manual gestures)

had consequences (rewards). In the earlier studies, the apes received rewards for their signing, illustrating the typical results of operant, conditioned behaviour, not language acquisition. Regarding Kanzi, there was also the ever-present reward of food (one of the things they 'talked' about as a shared experience). Despite their successes, the apes did not learn the symbolic function of language. Based on the empirical evidence, it simply is not possible to determine if the sign for *banana*, for example, represented the linguistic concept of 'banana' the way it does for human children (based on perceptual properties of the class of objects known as bananas), or if the manual sign was merely a non-linguistic task that the apes had to perform in order to get one. This has been as true for Kanzi as it was for Nim.

The apes also seemed to learn how to imitate the trainer's input. They could form many signs, but they could not string them together to make contrasts. With Nim, his MLU (mean length of utterance, or the length of his 'sentences') was essentially flat, restricted to one sign with a small number of two-sign combinations. Perhaps most importantly, the ordering of the elements of ape signing (or their syntax) was of no effect and, therefore, meaningless. To illustrate how significant this is, putting words in a different order in English changes the meanings of sentences (e.g. 'John hit Larry' versus 'Larry hit John'). Nim's utterances qualified only as a kind of word salad. To further confuse the issue, he would sometimes guess what an appropriate response would be to a question by rapidly making clusters of signs (in random order). In place of language-like syntax, there was a great deal of repetition of a very small number of signs, typically, *me*, *you* and names of participants and food objects and actions such as 'eat'! He apparently succeeded only in learning how to get the things he wanted.

On the one hand, an important aspect of the apes' gesturing behaviours in the earlier studies was their complete lack of creativity and spontaneity, and their passive receptivity to the trainers' prodding. Trainers could mold their hands to approximate an appropriate sign to accomplish a specific task, but this simply cannot be done with children. In contrast, deaf children naturally babble with their hands in the absence of aural feedback to their oral babbling. On the other hand, Kanzi's behaviour was spontaneous from the start, emphasizing the superiority of the methodology and pointing to the limitations of behaviourist methods.

Perhaps the most serious blow to the early research was that the apes' signs were interpreted by their trainers. The researchers would interpret the meanings of the apes' gestures as correct when they were ambiguous at best, so it seemed that 'close enough' counted. From the academic perspective, this is a very serious charge. It amounts to discrediting the validity of the research. Ape signing, when shown to users of American Sign Language (ASL), was not understood as ASL, despite the claims that the apes were in fact learning ASL. Seidenberg theorizes that the television documentaries of Koko and Washoe gained wide acceptance because the utterances shown were selected in advance for filming and represented the apes' best efforts. Their





There is no actual evidence for the gradual development of the language instinct in chimpanzees.

performances did not reflect what they did on a regular basis. With videos of Washoe, the signing was also accompanied by running commentaries by the researcher of what the ape was ‘saying’, including intonation and emphasis that magnified the impression that the chimp was indeed ‘talking’. In contrast and to their credit, Kanzi’s researchers have compiled videos that appear to show the bonobo’s abilities in interesting, candid and powerful ways.

### **Human languages: are some more evolved than others?**

Currently, some scholars express concern about Darwinian principles applied to language, perhaps not so critical of evolutionary principles *per se*, but to what is termed neo-Darwinian linguistics. In a biting ‘Discussion Note’ in a recent issue of *Language*, the official journal of the Linguistics Society of America (LSA), Michel DeGraff, an MIT syntactician, discusses the ‘traditional’ view of creole languages in Darwinian terms, based on a perceived simplicity of structure.<sup>20</sup> And just as recapitulation theory asserts that ontogeny recapitulates (or repeats) phylogeny (kinds of living entities), i.e. the development of a human embryo reflects stages of biological evolution—a theory that has been discredited in its strong form, it has been thought that the emergence of a creole language from a pidgin variety reflects stages in the evolution of human language.

In a nutshell, the literature on pidgin and creole languages has changed a great deal in recent years. One approach that reflects such change is based on the theoretical

position that creoles develop from pidgins, and that they are greatly reduced and simplified (read *inferior*) versions of their parent languages, in many cases, European colonial languages such as French, English, Portuguese and so on. Current research has challenged such claims based on empirical evidence (e.g. no Caribbean creole has an attested pidgin language in its ancestry). Most current approaches begin with the idea that second/subsequent language acquisition (SLA), under very specific and unfortunate circumstances, was the key process involved but only up to a point. As a learner’s variety of the colonial language took root and became conventionalized, speakers could then expand the linguistic range of this so-called ‘creole’ with different sorts of innovations, i.e. grammatical and lexical (vocabulary) expansion through normal mechanisms of language change. Thus, a language is born and evolves (or develops). Original native languages, of course, played a large role as well, via transfer of prior linguistic knowledge, in particular, through the unconscious application of native pronunciation patterns, and prior grammatical and semantic knowledge of their native tongues. Consequently, creoles do not evolve *ex nihilo* (out of nothing) regardless of how they may appear to native speakers of the European variety that has been creolized.

It should be noted, too, that there is no basis whatsoever for the assumption that the Africans who had been forcibly kidnapped and brought to the so-called New World were monolinguals, speakers of only one African language. There is a great likelihood that bi- or multilingualism was quite common. Most of the very negative views of the slaves’ attempts at speaking the so-called master’s language were the results of Europeans’ (white, native speakers of the European languages) impressions of the speech of the Africans. To the prejudiced ears of these native speakers, the slaves sounded crude and uneducated, and their speech was highly accented, which is precisely what one should expect of anyone being forced to learn a language under the horrific conditions placed upon the slave population. In the view of many of the Europeans, Africans did not appear to be capable of learning the more civilized European languages, a view which fit conveniently with current racist beliefs.

According to DeGraff, a native speaker of Haitian (Creole French), there has been an ‘imperialist construction of political, cultural, and racial hegemony, making it impossible to view Caribbean creole languages as being on a genealogical or structural par ...’ with their European counterparts.<sup>20</sup> He goes on to argue convincingly that Haitian is as close to European French as French is to Latin and that Jamaican Creole English (the ‘patwa’) is as close to English as English is to Proto-Germanic. He argues that there was no break in transmission, as claimed by some authors,<sup>21,22</sup> that the European languages were, in fact, learned in some (albeit non-native) fashion. DeGraff also states that any objective view of the syntax of Haitian shows its inherent complexity, comparable to any so-called ‘normal’ language.<sup>20</sup> He does not discount the role of the ‘mother tongue’ in SLA, and that the Africans quite likely

transferred aspects of their native languages to the non-native learning of French. But, he fiercely resists the idea that the Africans' native language(s) forming a substrate were somehow inferior and the speakers themselves somehow linguistically or cognitively inferior by implication. In this last point, DeGraff is joined by the vast majority (I would hope, all) of the community of linguists.

Another example of recent criticism of a Darwinian perspective applied to language comes from Frederick Newmeyer, a past president of the LSA. In a review article, Newmeyer<sup>23</sup> reviews three books, one of which is *Language in a Darwinian Perspective* (henceforward LDP), by Bernard H. Bichakjian. Newmeyer's candid evaluation includes that LDP is 'bizarre', and that it attempts to apply 'defective argumentation in an attempt to explain non-existent "facts".' He does refer to other evolutionary thinkers in positive ways, but his criticism of this specific book seems focused on the apparent lack of empirical evidence, namely the assumption that languages 'advance' and become more functional (a term that Bichakjian does not carefully define, according to Newmeyer), and that there is a directionality to change along evolutionary lines, something that has been argued against for over a century. In referring to the work of Bichakjian and others here, there is no attempt to imply a lack of integrity nor any sort of racist belief on the part of the authors. Any sort of criticism specifically refers to an approach that attempts to associate language change with the evolution and development of biological species, that substitutes by analogy (a) the order and systematicity of language structure and form with (b) a linear progression of life forms, an analogy that consistently fails.

Neither DeGraff nor Newmeyer can be accused of arguing from a biblical perspective, yet both reject specific implications of Darwinism in some way. To DeGraff, it is the implication that Africans and their languages are somehow inferior to their European counterparts, and to Newmeyer, it is the long-abandoned idea of a unidirectional progression to the evolution of particular languages.



Monkeys have interesting abilities to discern and produce language-like sounds, yet lack the syntactic abilities that *all* humans possess.

DeGraff cites the French linguist, Lucien Adam (an ironic twist), who classed languages into 'natural' (those spoken in the wild by savages) and 'civilized' languages, those used in civilized, European cultures. No one has to point out the cultural bias in such statements, but it is worth noting that in the case of creole languages, we are, in fact, discussing spoken languages. We are not comparing literatures that took centuries to develop with oral traditions that may have emerged within a few generations. In the case of the evolution of European languages, the empirical evidence simply does not sustain a belief in any sort of evolutionary perspective.

## Discussion

There is a great gulf between human language and animal communication. As a result, one must wonder how it is that every member of humankind has this capacity while none of the other ten million (or so) species does. If chimps and humans are equally 'evolved' or developed (having a common ancestor, as evolutionary thinking would have us believe), then why is it that no other primate species also has it, at least in some form? All things being equal, the premise for the *Planet of the Apes* series of films seems quite reasonable assuming the accepted beliefs of evolutionary thinking. Furthermore, applying the principle of 'equal development' to a wider sample, one must ask why orders of reptilians, that have presumably been around longer than their mammal counterparts, have not also developed some sort of language skills. This is the stuff of science fiction, not true science. Apparently, we are to assume that the mathematical probabilities are 1 in 10,000,000 that any species will develop language, and humans are the winners. We just happen to have the optimal biological makeup, and inhabit the optimal planet with the optimal environment in the optimal solar system in the optimal galaxy.

The knowledge of language sets us apart from all other species that we know of so far (or that we can all agree to knowing). It is part of our unique heritage, our biological endowment. Its significance may be difficult to appreciate because so many aspects of it are unconscious and taken for granted. We are simply unaware of *what* we do *when* we do language. From a biblical perspective, it is an aspect of our humanity that links us to the infinite. It allows us to gain and express real knowledge, to learn of our respective environments and ourselves, and ultimately to reach many things and ideas that are beyond our individual capabilities. The obvious coherence of language and the language faculty raises significant questions about how random mutations could possibly account for such profound and effective order.

The predictability of language places its acquisition and use, in perception and performance, well within the realm of design. To argue that the order and systematicity we see are merely the 'appearance' of design stops short of explanation,

and it certainly does not follow the evidence to its logical conclusion. Every working part of the language faculty is necessary—remove any connection or component organ and the system fails. In other words, alter the design and the consequence is a breakdown of the system. Thus, design is a reasonable assumption. Human language and its users are perfect fits, compatible in every respect, just as the ideal software is systematically compatible with its hardware (wetware, in the case of the human brain). When a structure functions as an information processing ‘machine’ with such astounding speed and efficiency as that intrinsic to language, the terms *intelligent design* certainly seems appropriate: life from life, intelligence from intelligence, information from information. There does not appear to be a plausible explanation for how either the faculty of language or human language could have developed from essentially nothing to what we know it to be without leaving evidence of intermediate steps; how they could have developed simultaneously is even a greater problem, despite the imaginative stories spun by Darwinian thinkers. The gap is too large. It is ontological (transitional forms do not exist) and not just epistemological (a matter of the lack of knowledge).

From the biblical viewpoint, design is characteristic of the entire universe, and only in a stable universe can an outcome be completely assured and anticipated, and knowable. Jet airplanes can fly because certain physical laws exist and interact. If you doubt this, then you are not very likely to accumulate a lot of frequent-flyer miles.

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