The social instinct

The cultural foundations of human language is a story very much in the making, says **Daniel Everett**, because it must first challenge the claim that language is innate

NOTHING sets *Homo sapiens* apart from other species more clearly than the possession of language and culture. Using features of language unique to our species we can communicate almost anything that pops into our heads. This capacity enables us to learn from and elaborate on the lessons of previous generations: we use values acquired earlier, plus trial and error, to improve our lives. The unbeatable combination of language and culture has made us lords of the Earth.

The question for anthropologists and linguists, however, is not why language and culture are so great, but what makes them possible in the first place. p

We know that these two cognitive-social tools are related: the burning issue is to understand the nature of this relationship. Since Aristotle and Plato, there have been two main approaches. From the Platonic tradition comes the "nativist" idea that language is predetermined, having one immutable shape dictated by the genes (or the gods). It is a one-way street: language facilitates culture but culture's influence on language is minimal. Aristotelian ideas, however, argue that much of language is set by cultural conventions and that it serves our peculiar "social instinct".

For the past 50 years or so, the dominant theory followed Plato, asserting that language is an innate capacity of the human brain – and culture is at best peripheral to understanding the faculty of language. Throughout the 20th century, theorists such as Roman Jakobson and Noam Chomsky developed the hypothesis in extremely interesting ways. In Chomsky's version, individual languages are elaborations on a computational system (grammar) provided by the human genome. Culture is irrelevant for the core aspects of this system.

I must admit I am puzzled by the continued popularity of nativism. For decades, research supported the idea that language is formed by a number of independent factors, leaving little, if any, work for a "universal grammar" or "language instinct" to do. Some researchers go so far as to argue that universal grammar is nothing more than tautology: humans have language because humans have language.

It may be that nativism persists because it seems hard to falsify. However, according to Philip Lieberman, a cognitive scientist at Brown University, Rhode Island, it makes one testable, if paradoxical, prediction. According to universal grammar, not all features of language would in fact be universal. Under nativism, we would expect that some humans are incapable of learning some human languages others can learn. If we could find a population of humans who could learn one type of language but not another, we would have striking support for nativism.

How so? The potential inability of some humans to learn some languages follows from nativism because cultures can affect genes. Genes always vary within a population due, among other reasons, to mutations. Culture, as part of the environment, exerts pressures that can favour one genotype over another. For example, genes for oxygen processing in some Tibetan populations have changed greatly in only the past 3000 years. If culture exerts selection pressure that favours some genes over others, it is unlikely that evolution would preserve an unvarying innate grammar across all populations when it would be much less costly for people to learn their local languages more easily by simply shutting off other options from their genotype. People could avoid the bulk of the language-learning process by drawing on innate grammatical information specific to their cultural niche.

So nativism predicts that some populations will be unable to learn all human languages. For example, a population might be unable to learn, say, Spanish, where the subject may be freely omitted in most sentences. Spanish is likely to have inherited this characteristic from Indo-European languages, which would mean the feature is at least 6000 years old – well within the time period of known genetic changes. Yet this prediction is not only false for all humans ever tested, it also seems highly unlikely that any normal human would not be able to learn any particular human language.

Some early American linguists such as Edward Sapir avoided the nativist pitfalls, arguing human language is a cultural artefact:

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an outgrowth of the interaction between intelligence and values, communicative need, tradition and conventions. In *Language: the cultural tool*, I have tried to develop a fuller account of the effects of culture on the form and meanings of human languages. For me, language is a good solution to the problem of human communication, the need to satisfy our "social instinct" and establish meaningful relations with others.

The Pirahã language of the Brazilian Amazon is just one of the world's 7000 languages, all of which show cultural effects on grammar. But Pirahã, which I studied for nearly 30 years, is very interesting because it contains much that is unusual for speakers of western languages. For example, while Pirahã has consonants and vowels just like any other language, it has one of the smallest sets of phonemes known – eight consonants and three vowels for men and seven consonants and three vowels for women. That's right, women have one fewer consonant than men. Where men have the phonemes "s" and "h", women have only the phoneme "h" (though some women use "s" in certain contexts).

"The Pirahãs decided they'd like to learn to read and write their own language… but it turned out that they did not allow literacy into their culture"

Cultural sanction

Not only do Pirahã men have more phonemes than women, they have more culturally sanctioned "space" in which to form their sounds. Male pronunciation uses a more extensive articulatory space, with an unconstricted pharynx (in the upper throat area, sitting above the larynx or "voice box") and the tongue making contact with the roof of the mouth closer to the teeth. Women constrict their pharyngeal walls for the beginning closure of their "pharyngeal stop", resulting in a more guttural sound, and their tongues block the flow of air for "t" and "n" – their only tongue-articulated consonants – farther back from their teeth. The result is Pirahã women use fewer phonemes within a smaller articulatory space than men.

There is no linguistic reason for the contrast between men's speech and women's speech in Pirahã: it emerges from Pirahã values and culture, just as the speech of English-speaking men and women differs in many ways. For example, women often use different colour terms and descriptive phrases than men. The sentence: "I love that lavender top on you" would almost certainly have been uttered by a woman. Men use non-standard forms, so a man might say: "I went walkin' ", while a woman might say: "I went walking." Similarly, Pirahã culture distinguishes between men and women's pronunciation because it "wants to".

Another of the myriad ways culture and grammar interact lies in what seems to be the culturally unique lack of recursive structure in the Pirahã syntax. Recursion was claimed to be the innate core of human language in a famous *Science* paper published by Marc Hauser, Noam Chomsky, and Tecumseh Fitch in 2002, "The faculty of language: what is it, who has it, and how did it evolve?".

A recursive process is a process that applies to its own output: it can make sentences non-finitely long, its hallmark being grammatical units of one type embedded in another of the same type, such as noun phrases within noun phrases ("John's brother's friend's wife's sister"), or sentences within sentences ("Peter said that Mary said that John said that ›

Mortimer would be here tomorrow").

A language without recursion would be a counter example, and this I claim for Pirahã. Such a language would falsify the recursion claim even when, as with the Pirahãs, its speakers can learn recursion in other languages or show evidence of thinking recursively. If one language can exist without recursion then, in principle, all can. This is irreconcilable with the claim that recursion is the sine qua non of human communication.

The claim that Pirahã lacks recursion has recently been corroborated by cognitive scientists at Tufts University in Medford, Massachusetts. And other studies are underway at the brain and cognitive sciences department of the Massachusetts Institute of Technology,. Still, the claim continues to be surprisingly controversial, as we show in a new documentary, *The Grammar of Happiness*, about my life and work. The fact that Pirahã lacks recursive syntax is an interesting discovery. More important, however, is the argument that this lack of recursion is imposed by Pirahã cultural values.

Pirahãs require evidence, something I call the "immediacy of experience principle". It requires, among other things, that all Pirahã sentences be "warranted" by evidence and that evidence is represented in the verb. There are three suffixes: "hearsay" (someone told you, you didn't see it yourself); "deduction" (you see the evidence, but did not see the act, as in "John left + deductive suffix", meaning something like, "John must have left, because his canoe is gone", or "... because I can see his footprints leading off into the jungle"); and "direct observation" (as in "John left. I saw him leave", where, unlike in English, the "I saw him leave," part of the sentence would be a suffix).

Nothing can be uttered unless it is warranted by one of these suffixes. The interesting consequence for Pirahã grammar (and theories of human language) is that this culturally based requirement for evidence makes recursion in the grammar impossible. This is because any grammatical category (noun, verb, sentence, and so on) specified in a verb's meaning must be "authorised" by the evidential suffix and only categories so authorised may appear. A phrase buried within another phrase carries units that are not part of the meaning of the verb in which they are embedded and so they are not authorised by that verb's evidential marker.

For example, the verb "give" requires three nouns (or "arguments"): the giver, the thing given, and the goal of the giving. John (the giver) gave the book (the thing given) to Bill (the goal). It is not strictly grammatical in English to say only "John gave" or "John gave the book." Outside literature, you have to give all three arguments (or more) each time.

> "Pirahã represents a solid counterexample to the idea that recursion is the principle genetic facilitator of human languages"

Pirahã is like this except that unlike English, Pirahã's cultural requirement on evidence allows only three arguments. To say: "John's sister's best friend gave Bill's father-in-law's buddy a book" would leave "sister's" and "father-in-law's" unwarranted because they are not found in the verb's three arguments (giver, given, goal). In my book, I explain in more detail how this cultural requirement for evidence rules out recursion in Pirahã.

This restriction on Pirahã's grammar and the grammar's peculiar form is cultural. So Pirahã represents a solid counter example to the idea that recursion is the principle genetic facilitator of human languages. It also shows that grammar in its most basic form can be profoundly shaped by the values of the culture of which it is part. Such considerations raise

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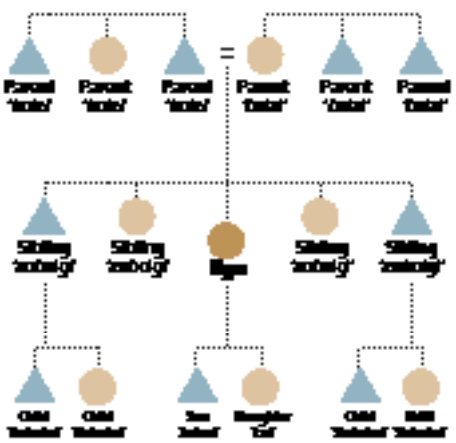

Culture adapts language to its own needs

the question of how much work there is for a universal innate grammar to do.

Culture can affect more than the syntax and sound systems of languages. It can also profoundly constrain the meanings that languages can express. Thus Pirahã lacks terms for colour and numbers, it has the simplest kinship system known (see diagram, left). It has very few words for time, it lacks all variants of the perfect tense (such as in the past perfect "I had already eaten"), and other characteristics once thought common to all languages.

It bears repeating that culture has similar effects on the grammar of all languages: it's just that Pirahã has ones that are easy to spot. Take literacy. As societies adopt a written language for cultural reasons, their grammars often change. Perhaps, more accurately, they begin to adopt a second grammar – a grammar of written versus spoken speech. Many studies show written and spoken language differing in numerous, often profound, ways, such as sentence length, complexity of paragraphs, and so on. The new features of the written language are caused by alterations in the way we express our syntax, owing, ultimately, to the cultural decision to write the language.

No literacy here

That this is cultural is shown in an incident back in the early 1980s. After seeing me read and write, the Pirahãs thought they might like to learn to read and write their own language. I began to teach them the Pirahã orthography I had developed based on my analysis of their phonology. After several weeks, one day an entire houseful of Pirahãs read from my blackboard the word bigí or "ground" in their language. They all pronounced it accurately. I was delighted! I had taught them to read.

But they confused me by breaking out in raucous laughter. I asked why. "That sounds just like our word for 'ground'," they said. "But that is your word for 'ground'," I replied. "Oh, no, we don't write our language. Is that what you are doing? We don't want this." End of lessons. It turned out the Pirahãs did not allow literacy into their culture so its grammatical changes were also excluded – by choice.

The idea of language as a cultural tool makes it easier to see why after 100 years of research we still lack a noncontroversial set of structures found in all languages, a set that is predicted by a universal grammar. The idea of culture adapting language to its own needs helps us get beyond politically correct notions, for example, that all languages are "equally complex". No one knows what that would mean because there are so many ways to measure complexity, even though the claim is regularly asserted under the assumption that language is found in the genotype.

The moral of this tale is not that culture is responsible for everything in language. Not at all. Recent research by teams led by Ted Gibson of MIT and Steve Piantadosi at the University of Rochester, New York, reveals non-genetic factors that can shape the way information is structured, and why some word orders are more common than others. And their work on ambiguity shows it to be "a functional property of language that allows for greater communicative efficiency". What is important is that there is no need to appeal to nativism to understand this major part of linguistic meaning because it is motivated by non-linguistic and non-genetic factors.

Other work by, among others, Bill Croft of the University of New Mexico, has shown a role for the non-genetic factor of "iconicity", linguistic forms being shaped by meanings. For example, the more complex the idea, the more complex the linguistic structure: "the Devil made me do it" has more words than "the Devil did it" because the first sentence expresses causation, which is more complex than the simple transitiveness of the second.

In the end, the question that must worry those who argue there is a language instinct, a universal grammar and the like, is this: if language is shaped by communication, cultural values, information theory and the nature of the brain as a whole, what is there left for a universal grammar to do?

There are far too few studies of the effects of culture on grammar, though there are many on the effects of language on thought, cognition, and culture. In future, I hope linguistic anthropologists, cognitive scientists, and philosophers will consider more carefully Aristotle's social instinct and the problem it raises – the need to communicate. Language is a set of solutions to the problem forced on us by the social instinct, each solution shaped by a local culture.

Not so much a language instinct, then, as a social and communications instinct. And while this may sound like a small difference of emphasis in the story of language, it is in fact nothing short of a completely different story.

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NEXT WEEK: in an interview with Noam Chomsky he talks about language, human nature and denialism