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Language lessons: You are what you speak

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Following inbuilt rules
(Image: Charles Gullung/Getty)

LANGUAGES are wonderfully idiosyncratic. English puts its subject before its verb. Finnish has lots of cases. Mandarin is highly tonal.

Yet despite these differences, one of the most influential ideas in the study of language is that of universal grammar. Put forward by Noam Chomsky in the 1960s, it is widely interpreted as meaning that all languages are basically the same and that the human brain

is born language-ready, with an in-built program that is able to decipher the common rules underpinning any mother tongue. For five decades this idea has dominated work in linguistics, psychology and cognitive science. To understand language, it implied, you must sweep aside the dazzling diversity of languages and find the common human core.

But what if the very diversity of languages is the key to understanding human communication? This is the idea being put forward by linguists Nicholas Evans of the Australian National University in Canberra and Stephen Levinson of the Max Planck Institute for Psycholinguistics in Nijmegen, the Netherlands.

They believe that languages do not share a common set of rules. Instead, they say, their sheer variety is a defining feature of human communication – something not seen in other animals. And that's not all. Language diversity is the "crucial fact for understanding the place of language in human cognition", Levinson and Evans argue.

In recent years, much has been made of the idea that humans possess a "language instinct": infants easily learn to speak because all languages follow a set of rules built into their brains. While there is no doubt that human thinking influences the form that language takes, if Evans and Levinson are correct, language in turn shapes our brains. This suggests that humans are more diverse than we thought, with our brains having differences depending on the language environment in which we grew up. And that leads to a disturbing conclusion: every time a language becomes extinct, humanity loses an important piece of diversity.

Since the theory of universal grammar was proposed, linguists have identified many language rules. Although these are supposed to be universal, there are almost always exceptions. It was once believed, for example, that no language would have a syllable that begins with a vowel and ends with a consonant (VC), if it didn't also have syllables that begin with a consonant and end with a vowel (CV). This universal lasted until 1999, when linguists showed that Arrernte, spoken by Indigenous Australians from the area around Alice Springs in the Northern Territory, has VC syllables but no CV syllables.

Other non-universal "universals" describe the basic rules of putting words together. Take the rule that every language contains four basic word classes: nouns, verbs, adjectives and adverbs. Work in the past two decades has shown that several languages lack an open adverb class, which means the number of adverbs available is limited, unlike in English where you can turn any word into an adverb, for example soft into softly. Others, such as Lao, spoken in Laos, have no adjectives at all. More controversially, some linguists argue that a few languages, such as Straits Salish, spoken by indigenous people from north-western regions of North America, do not even have distinct nouns or verbs. Instead they have a single class of words to encompass events, entities and qualities.

Even apparently unassailable universals have been found wanting. This includes recursion, the ability to infinitely embed one item in a similar item, such as "Jack thinks that Mary thinks that... the bus will be on time". It is widely considered to be a characteristic that sets human language apart from the communications of other animals. Yet Dan Everett at Illinois State University recently published controversial work showing that Amazonian Pirahã does not have this recursive quality (*Language*, vol 85, p 405).

The more we learn about languages, the more apparent the differences become (see "Tower of Babel"). While most linguists have somehow lived with these anomalies, Evans and Levinson believe they cannot be ignored. "The haul of clear and empirically impeccable universals, after decades of searching, is pitiful," Evans notes. He and Levinson argue that the idea of universal grammar has sent researchers down a blind alley. We should embrace linguistic diversity, they say, and try to explain the forms that languages actually take. To that end, they published a paper outlining their theory in *Behavioral and Brain Sciences* last year (vol 32, p 429). Everett has described it as "a watershed in the history of linguistic theory".

If languages do not obey a single set of shared rules, then how are they created? "Instead of universals, you get standard engineering solutions that languages adopt again and again, and then you get outliers," says Evans. He and Levinson argue that this is because any given language is a complex system shaped by many factors, including culture, genetics and history. There are no absolutely universal traits of language, they say, only tendencies. And it is a mix of strong and weak tendencies that characterises the "bio-cultural" hybrid we call language.

According to the two linguists, the strong tendencies explain why many languages converge on common patterns. A variety of factors tend to push language in a similar direction, such as the structure of the brain, the biology of speech and the efficiencies of communication. Widely shared linguistic elements may also build on a particularly human kind of social reasoning. For example, the fact that before we learn to speak we see the world as a place full of things causing actions (agents) and things having actions done to them (patients) explains why most languages deploy these categories.

Origins of diversity

Weak tendencies, in contrast, are explained by the idiosyncrasies of different languages. Evans and Levinson argue that many aspects of the particular natural history of a population may affect its language. For instance, Andy Butcher at Flinders University in Adelaide, South Australia, has observed that Indigenous Australian children have by far the highest incidence of chronic middle-ear infection of any population on the planet, and that most Indigenous Australian languages lack many sounds that are common in other

languages, but which are hard to hear with a middle-ear infection. Whether this condition has shaped the sound systems of these languages is unknown, says Evans, but it is important to consider the idea.

Levinson and Evans are not the first to question the omnipotence of universal grammar, or UG, but no one has distilled these ideas quite as convincingly and given them as much reach. As a result, their arguments have generated widespread enthusiasm, particularly among those linguists who are tired of trying to shoehorn their findings into the straitjacket of "absolute universals". To some, it is the final nail in UG's coffin. "Recent strategies like saying that not all language must have all components of UG – with no explanation of the variation – just immunise UG from falsification," says Michael Tomasello, co-director of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. A developmental psychologist with particular interest in language acquisition, Tomasello has been a long-standing critic of the idea that all languages conform to a set of rules. "Universal grammar is dead," he says.

Steven Pinker of Harvard University, who is the author of *The Language Instinct*, agrees with many points made by Evans and Levinson, including the fact that the standards for a "universal" have not been rigorous enough; that language arises from the co-evolution of genes and culture; and that it is very important to document the diversity of languages. Still, Pinker argues that all humans do share an innate set of mechanisms for learning language. He accepts that the extent to which different languages use these mechanisms may be shaped by that culture's history, but still believes there are many universals that underlie all languages.

Others claim that just because we have not yet worked out exactly what constitutes a universal in language, doesn't mean they don't exist. Tecumseh Fitch at the University of Vienna in Austria says that from the outset Chomsky's own definition was quite sophisticated. "In introducing the term 'UG', Chomsky made it clear that these features are highly abstract and not [the same as] absolute surface universals," he says.

"If universal means a 'bias that can be violated' then I'm happy to use universal in that special sense," says Evans. "I don't think that's the sense in which it was originally intended. But if that's what UG ends up morphing into, then fine, we can move on to more interesting questions."

Diversity in mind

Among the most important of these is what the Evans-Levinson approach says about our species. The diversity of human language sets it apart from the communication systems of all other animals, which tend to be the same for any group in any species, no matter where

on the globe they live. True, some animals, including songbirds and higher primates, do have a range of learned expressions that can vary from one population to another, but none is remotely as diverse as human language. Evans and Levinson attribute our linguistic exuberance to the plasticity of the human brain, and they say it changes how we should think about human thought.

The standard modern metaphor for cognition is the "toolbox", with humans sharing some tools with other animals while having others that are exclusive to us. For Evans and Levinson, cognition is more like "a machine tool, capable of manufacturing special tools for special jobs… like calculating, playing the piano, reading right to left, or speaking Arabic". In this view, the brain of a child does not arrive pre-programmed with abstract linguistic rules. Instead, its initial setting is much simpler: the first job of the brain is to build a more complicated brain. This it does using any input that it gets, including language. This could mean that speakers of very different languages have quite different brains, says Levinson.

"Each of the world's 7000 or so languages contains its own unique clues to the mysteries of human existence"

Taking diversity at face value also gives linguists an opportunity to re-examine old dogmas. For example, it is assumed that all languages are equally easy to learn, yet this has never been tested. Evans believes that given the number of variable factors that shape languages, there might well be differences in how quickly infants reach particular linguistic milestones depending on the idiosyncrasies of their mother tongue. "We need to revisit this idea," he says.

Another classic dogma is that we all master the fundamental structure of our native language by early childhood. Indeed, one of the most compelling aspects of the UG-language-instinct idea was that it seemed to explain how infants do this with such ease. However, it turns out that in some languages there are some aspects that are not mastered until later in life, such as the triangular kin terms of the Indigenous Australian language, Bininj Gun-wok. These situate the speaker, listener and a third party relative all at once. For example "al-doingu" means "the one who is my mother and your daughter, you being my maternal grandmother". And this is not an oddity; there are hundreds of such structures in the language. The speakers of Bininj Gun-wok only begin to acquire this part of the language in their twenties.

Focusing on language diversity also highlights the tragedy of language extinction. In the old model, all languages are merely variations on the same underlying theme. In the new model, however, each of the world's 7000 or so languages contains its own unique clues to some of the mysteries of human existence. "Observations about animal species,

distinctness, behaviour and ecological relationships which are captured in the vocabulary of some languages distil millennia of close observation by the speakers of those languages," says Evans. For example, some languages spoken in Arnhem Land, in Australia's Northern Territory, have words for five species of bee not yet described by science. "A typical language in [that area] will contain a veritable library shelf of ethnobiology that is on the verge of being lost without us ever knowing what books were there," says Evans.

In the diversity of the world's languages we find facts about ancient human history, the path of languages through time, and deep knowledge of the planet. Seen in this light, languages and their speakers offer a scientific bonanza to anyone trying to understand human evolution, behaviour and cognition.

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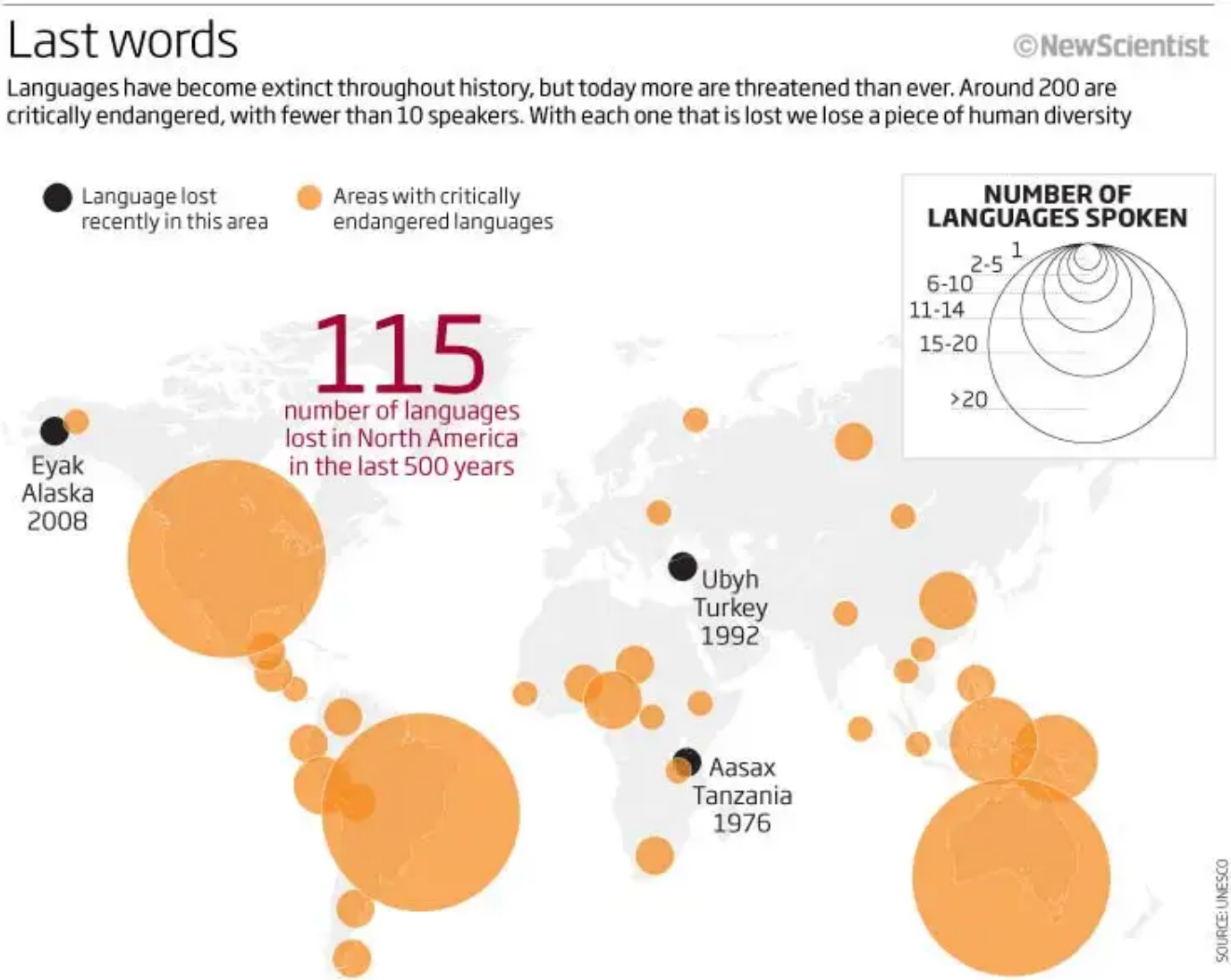

Tower of Babel

After half a century of trying to find a common pattern among all languages it is increasingly clear that they are not the same.

- Some languages have 11 distinct sounds with which to make words, while others have 144. Sign languages have none. As sounds that were once thought impossible are discovered, the idea that there is a fixed set of speech sounds is being abandoned.

- Some languages use a single word where others need an entire sentence. In English, for example, you might say "I cooked the wrong meat for them again". In the Indigenous Australian language Bininj Gun-wok you would say "abanyawoihwarrgahmarneganjginjeng". The more we know about language processing, the less likely it seems that these two structures are processed in the same way.

- Even plurals are not straightforward. The Kiowa people of North America use a plural marker that means "of unexpected number". Attached to "leg", the marker means "one or more than two". Attached to "stone", it means "just two".

- Some major word classes are not found in all languages. English, for example, lacks "ideophones" where diverse feelings about an event and its participants are jammed into one word – as in "rawa-dawa" from the Mundari language of the Indian subcontinent meaning "the sensation of suddenly realising you can do something reprehensible, and no one is there to witness it".

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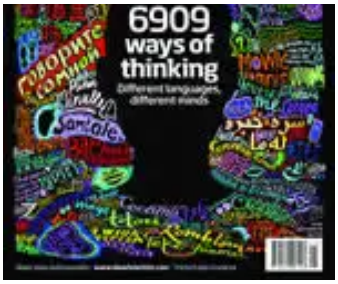

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