

- Language and languages

HUMANS // LANGUAGE

PRINTED FROM PRESSREADER

NOT FOR SALE

# FINAL WORDS

➔ How would you feel if nobody else on the planet spoke your mother tongue? Languages are like organisms: they thrive, they evolve - but they can also go extinct if they are outcompeted by an invading giant. Scientists are identifying why languages are at risk to the big 'super languages', and are investigating whether they might yet be saved.

SHUTTERSTOCK & LOTTE FREDSLUND

46 | SCIENCE ILLUSTRATED



Some 1500 languages face extinction, outcompeted by those which dominate business and trade. English, Mandarin and Hindi are the global language leaders.

By Stine Overbye



## HUMANS // LANGUAGE

Unless you are reading this article as part of an effort to learn English, it is safe to assume that you are one of around 1.5 billion people in the world today that are able to understand English. Including both native and non-native speakers, English is currently the most widely-spoken language on Earth, with 30% more speakers than Mandarin, and more than double those with Hindi.

A common language is of great value for communication among individuals, and for business and trade. But more widespread use happens at the expense of smaller languages, many of which are in danger of disappearing entirely. Every month an average of two languages fall silent, simply because no children have learned how to speak them.

Languages are like living creatures in some respects: they evolve and adapt. Some are strong and expanding, others short of breath, approaching extinction. Scientists estimate that some 40% of the world's approximately 7000 languages are threatened by extinction. Can anything be done to improve their chances? New research has some interesting answers.

### Gestures became sounds

Nobody knows when people began to use language as a communication tool. The oldest evidence of language is in writing, but that's only around 5200 years ago, in Sumerian texts of cuneiform characters.

But spoken language originated long before written language. Some scientists consider *Homo ergaster*, who existed 1.9-1.4 million years ago, to be the first human species to communicate using sounds. Scientists calculate that modern language may then have originated some 50,000 years ago, basing their conclusions on the structure of brains and the speech organs: airways, mouth, and nasal cavity,

What did our ancestors say? Some scientists suggest that the first words were likely imitations of sounds – such as 'atishoo', 'bang', or 'moo'. Others imagine that our ancestors gradually added sounds to gestures. According to this theory, sounds slowly outcompeted the gestures and later became words.

Scientists have two theories concerning the cradle of language. According to one, *Homo sapiens* brought language out

of Africa. This theory would mean that all languages have the same origin – which might indeed explain the many shared features of the world's languages.

But the other theory claims that humans had already spread to many parts of the world before the first languages developed. According to this theory, several languages originated at about the same time, resulting in the different language families we see today.

### Vowels prefer the tropics

Like organisms, language adapts to its surroundings, including the climate and landscape. A study led by linguists from the University of California combined data from 633 languages with information about the physical environment and climate in the regions where those languages are spoken. They found a clear pattern. Languages in warm forested regions such as the tropics tend to be more sonorous and lower in frequency, with fewer consonants than languages in dry, cold and mountainous regions.

So Hawaiian – from tropical Hawaii – is a round, melodic language in which all words end softly with a vowel. Georgian – spoken in mountainous Georgia – is stacked with hard consonants, especially at the starts of words.

One possible explanation, according to the linguists, is that a simple steady vowel sound can be heard through thick foliage or a cacophony of wildlife, whereas the high-frequency sounds in more consonant-heavy speech quickly lose their impact in moist and densely-grown surroundings.

### Diet influences language

The food we eat may also influence the development of language. In a study from 2019 led by scientists from Germany's Max Planck Institute in Jena, it was concluded that a change of diet in the Stone Age altered language markedly.

Before farming made its significant impact, hunter-gatherers had edge-to-edge bites in which the teeth of the upper and lower jaws met. This tooth position would make it difficult to produce clear 'f' and 'v' sounds – try it yourself by moving your jaw forwards. But some 5600 years ago, we began to farm the land and process food, with the position of teeth changing to the slight overbite that ▶

# 7168

languages exist in the world today, according to the scientists behind the Ethnologue project.



SHUTTERSTOCK



Hawaiian, and other languages originating in lush tropical regions, are richer in vowel sounds than languages from mountainous areas such as Georgia, where speech involve more hard consonants.

PRINTED FROM  
PRESSREADER

**Centres of speech form language**

→ Our language is controlled by two brain areas, the Brocas and Wernicke's speech centres. The Brocas area allows us to form words and sentences. Wernicke's is connected with being able to understand other people's sentences.

**No other species can talk like a human.**

# Three body parts produce language

Humans are able to communicate in a way that no other animal can, thanks to a number of unique anatomical features.

SHUTTERSTOCK & LOTTE FREDSLUND

**Bone controls the tongue**

→ The human tongue bone has a special shape that makes it ideal for controlling the tongue and hence uttering sophisticated sounds. Only in humans can the tongue bone cooperate with the larynx and the tongue to produce speech.

**The throat produces sound**

→ When air from the lungs flows up through the larynx, the flexible vocal chords begin to oscillate to produce sound. The vocal chords can be stretched by means of muscles, so that they can produce a series of different sounds.

HUMANS // LANGUAGE

► most of us have today. The result is that both ‘v’ and ‘f’ sounds are now frequent in the vast majority of modern languages.

**One language becomes more**

Languages evolve so quickly that it’s easy to tell a film from the 1960s by its idiom, while books written long ago can prove challenging to modern students. According to linguists, language changes slightly for every generation – so that over a few hundred years scientists can observe significant differences of pronunciation, grammar and vocabulary. Some words become pronounced differently, others fall out of use almost entirely, and new words are added all the time. New additions to Australia’s Macquarie Dictionary in 2023 included ‘WFH’, ‘doomscrolling’, ‘pandemic brain’, ‘pyrocumulonimbus’ (see p16) and ‘net-zero’ – these are words and phrases that would not have made any sense just a few years ago.

Cultural influence and spillover from other languages also play an important role – English has a massive influence on many languages. Indeed, a language can evolve to such an extent that it becomes one or more new languages. The most famous example is Latin – the modern



The Welsh language declined following Henry VIII’s Act of Union in 1536; not until the 1960s did new legislation allow a revival. It continues to grow: by 2018, 874,700 people (29.3%) could speak Welsh.

European languages of French, Spanish, and Italian are all dialects of the Latin spoken by Romans 2000 years ago.

**Languages invade by road**

While some new languages flourish, others disappear when the last people to speak them die. By 2100, as many as 1500 of the 7000+ existing languages may be extinct, according to a world-first 2021 study led by the Australian National University (ANU). They investigated 51

‘pressure point’ factors on languages, and one of the more surprising indicators turned out to be the number of roads.

“We discovered that the more roads linking countryside and villages with cities, the bigger the risk of a language becoming endangered,” says co-author Professor Lindell Bromham. “It’s as if roads are helping dominant languages ‘steamroll’ smaller languages.”

By far the biggest threat to small languages is the cultural and economic

# Languages can diversify over distance

Almost all the languages spoken by Europeans today derive from one single language: the ancient Indo-European language. It is the source from which more than 400 languages have evolved – spoken by some 60% of the world population today.

**The cradle was in Ukraine and Russia**

1 The ancient Indo-European language probably originated among the Yamnaya nomadic people 6000 years ago on the plains of Southern Russia and Ukraine. These people are famous particularly for burial mounds with single graves: kurgans.



pressure from languages which people perceive as more prestigious or more practical. 'Super languages' such as English, Spanish and Russian threaten and eliminate tribal and minority languages, because the big languages allow better access to education and jobs.

In Wales, the Welsh had been forced to use English for administration since the time of Henry VIII, so that by the 19th and early 20th century, the Welsh language was under threat. Nationalist efforts led to the establishment of Welsh-language schools and Welsh-language television and radio, growing awareness since the 1960s and contributing to the growing widespread use of Welsh today.

It is not only big languages that cause language death. In Africa, languages such as Masai, Somali, and particularly Swahili are outcompeting smaller tongues.

War, colonisation or genocide can also contribute to the death of a language, as evidenced by one terrible event in Central America. Following a massacre in 1932 in El Salvador, the government army killed some 25,000 native rebels, a blood-bath so complete that it caused the entire elimination of the native languages of Cacaopera and Salvadoran Lenca.

# 455

**languages - including most European ones - originate from the ancient Indo-European language.**

### How to revive a language


Scientists distinguish between dead and extinct languages: a language is dead (though some scientists prefer the term 'sleeping') if we can understand it, but do not speak it - as with Latin, say. An extinct language is a language that is no longer either written or spoken.

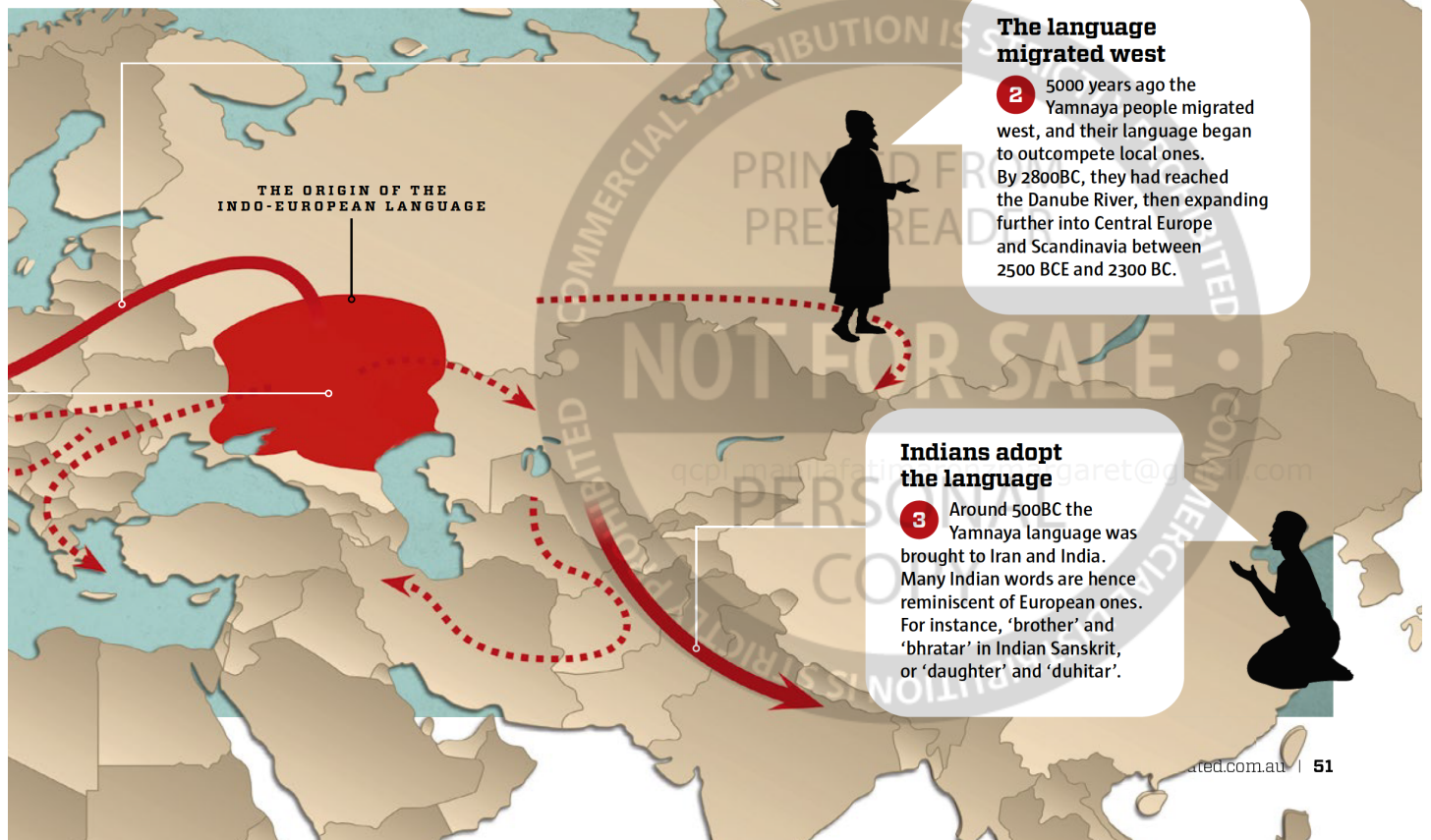
Most languages are spoken by fewer than 6000 people, and any language that dies is a loss to humankind - a bit of our cultural heritage disappears with a special way of viewing the world.

But even declining and sleeping languages

can be revived. The Welsh example shows that specific effort and desire on the part of a people can reverse the effect of a dominant invader. Another example is Hebrew, a Semitic language which all but disappeared as a spoken language around the birth of Christ - but remained in religious texts. Then in 1948, the new Israel made Hebrew an official language (as is Arabic), and it is now the mother tongue of some six million people.

Languages used by governments and education systems will always be strong. White Australia policies since 1788 had a devastating impact on the transmission of languages other than English here. But according to the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS), more than 250 Indigenous languages are in use, with 800 dialects.

"If our language survives, we survive as Warlpiri people, our language keeping us strong," says Theresa Napurrurla Ross, in a translation from her native Warlpiri tongue. "It's always kept us strong." 



### The language migrated west

- 5000 years ago the Yamnaya people migrated west, and their language began to outcompete local ones. By 2800BC, they had reached the Danube River, then expanding further into Central Europe and Scandinavia between 2500 BCE and 2300 BC.

### Indians adopt the language

- Around 500BC the Yamnaya language was brought to Iran and India. Many Indian words are hence reminiscent of European ones. For instance, 'bhratar' and 'duhitar' in Indian Sanskrit, or 'daughter' and 'duhitar'.

HUMANS // LANGUAGE

PRINTED FROM  
PRESSREADER

# How to learn a new language quickly

You are never too old, and certainly never too young, to learn a new language, and you can probably do it faster than you think - especially if you follow these five key pieces of advice from scientists and language teachers.

SHUTTERSTOCK

GUIDE



## START

### EFFECT:

You force your brain to learn.



## JUST DO IT

### WHY?

**?** It's a common myth that adults find it very difficult to become fluent in a new language. But according to several studies, most people can learn to speak any language fluently at any age - and adults can learn a new language just as quickly as children. Adult beginners can even relatively quickly form sentence structures at the level of people who have the language as their mother tongue. As a bonus, adults help keep their brains sharp when they work with language.

### HOW?

**!** Think you're too busy to learn a new language? Download a language app such as Rosetta Stone, Duolingo or Babbel and use it for 15 minutes a day. Try to integrate the language in your everyday life - such as writing shopping lists in the new language or marking things in your home with sticky notes. Talk to native speakers, read articles, listen to podcasts, and watch films in the new language. If possible, go on holiday in a country where the language is spoken.

## GUESSING



Bonjour!

### EFFECT:

You get the general idea.

52 | SCI

## HELICOPTER VIEW

### WHY?

**?** When you read a text in a new language, you will come across many unknown words. Many people begin by looking up all words - a process focusing more on details (words) than sentences. The bottom-up strategy will lead to an understanding of separate words rather than the text as a whole. So language teachers recommend another strategy: a top-down 'helicopter view': embrace the entire text and guess the meaning of unknown words or phrases.

### HOW?

**!** When you are reading a text and trying to decipher the meaning of a sentence, use your knowledge and experience. Guess the meaning of words based on other languages (your own) and on context. Read the text as a whole, disregarding specific difficult words. Assess your assumptions and guess - are they reasonable and likely? The top-down approach is also almost inevitable when you listen to a podcast or watch a film in a foreign language.

## REPETITION



## REPEAT WORDS AT THE RIGHT TIME

### WHY?

**?** In the book *Fluent Forever: How to Learn Any Language and Never Forget It* from 2014, American language genius Gabriel Wyner introduces the “spaced repetition” method as a way to learn a new language. The rationale is that short-term memory has very limited capacity: only seven new pieces of information at a time. But by repeating words at the right time, the short-term memory makes sure that words are transferred to long-term memory.

### HOW?

**!** Instead of working hard on short-term learning, repeat words during the days and weeks after you learned them. Make this repetition part of the routine of your everyday life. The aim is to expose the brain to the new words over and over – just at the moment you are about to forget them, repeat the words again so they are stored in long-term memory. You might also dedicate some days to repetition, and others to learning new words.

## FILM



## USE THE RIGHT SUBTITLES

### WHY?

**?** Scientists from the Max Planck Institute for Psycholinguistics in the Netherlands have discovered that if you watch foreign films with subtitles in your own language, language learning is not as efficient as watching the same films without subtitles – partly because the subtitles are in conflict with the spoken word. According to the language researchers, the best way to learn is to watch the film with original subtitles – in the language spoken in the film.

### HOW?

**!** If you are learning a foreign language, watching a film in that same tongue brings both language and cultural learning. But choose the original subtitles, not those in your own language to avoid simply reading instead of listening to what is said. And if you try to listen, subtitles will confuse you. But when you watch a film with subtitles in the language of the film, the written and spoken languages will supplement each other, and you achieve the best learning outcome.

## GESTURES



## LET YOUR HANDS DO THE TALKING

### WHY?

**?** If you would like to master a foreign language like a native speaker, it is not enough to know grammar and be able to roll your Rs, according to scientists. Language involves more than speech; we spontaneously and unconsciously convey meaning with our hands as we speak. Gestures express meaning in the same way as sounds, and gestures vary from language to language. The brain is puzzled if a person speaks one language but uses the gestures of another one.

### HOW?

**!** To get language culture under your skin, practise gesticulating in the same way as native speakers. When Italians and Japanese, say, use different gestures, it is not only a question of culture, but also about very different ways of expressing meaning. Carefully observe native speakers' gestures and try to imitate their motions as you speak. Letting go of your usual gestures and learning new ones in this way is difficult, but not at all impossible, according to scientists.