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# The Language Instinct

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series of alternating displays of behavior by sensitive, scheming, second-guessing, social animals. When we put words into people's ears we are impinging on them and revealing our own intentions, honorable or not, just as surely as if we were touching them. Nowhere is this more apparent than in the convoluted departures from plain speaking found in every society that are called politeness. Taken literally, the statement "I was wondering if you would be able to drive me to the airport" is a prolix string of incongruities. Why notify me of the contents of your ruminations? Why are you pondering my competence to drive you to the airport, and under which hypothetical circumstances? Of course the real intent—"Drive me to the airport"—is easily inferred, but because it was never stated, I have an out. Neither of us has to live with the face-threatening consequences of your issuing a command that presupposes you could coerce my compliance. Intentional violations of the unstated norms of conversation are also the trigger for many of the less pedestrian forms of nonliteral language, such as irony, humor, metaphor, sarcasm, put-downs, ripostes, rhetoric, persuasion, and poetry.

Metaphor and humor are useful ways to summarize the two mental performances that go into understanding a sentence. Most of our everyday expressions about language use a "conduit" metaphor that captures the parsing process. In this metaphor, ideas are objects, sentences are containers, and communication is sending. We "gather" our ideas to "put" them "into" words, and if our verbiage is not "empty" or "hollow," we might "convey" or "get" these ideas "across" "to" a listener, who can "unpack" our words to "extract" their "content." But as we have seen, the metaphor is misleading. The complete process of understanding is better characterized by the joke about the two psychoanalysts who meet on the street. One says, "Good morning"; the other thinks, "I wonder what he meant by that."

## 8

## The Tower of Babel

And the whole earth was of one language, and of one speech. And it came to pass, as they journeyed from the east, that they found a plain in the land of Shinar; and they dwelt there. And they said one to another, Go to, let us make brick, and burn them thoroughly. And they had brick for stone, and slime had they for mortar. And they said, Go to, let us build us a city and a tower, whose top may reach unto heaven; and let us make us a name, lest we be scattered abroad upon the face of the whole earth. And the Lord came down to see the city and the tower, which the children of men builded. And the Lord said, Behold, the people is one, and they have all one language; and this they begin to do: and now nothing will be restrained from them, which they have imagined to do. Go to, let us go down, and there confound their language, that they may not understand one another's speech. So the Lord scattered them abroad from thence upon the face of all the earth: and they left off to build the city. Therefore is the name of it called Babel; because the Lord did there confound the language of all the earth: and from thence did the Lord scatter them abroad upon the face of all the earth. (Genesis 11:1-9)

In the year of our Lord 1957, the linguist Martin Joos reviewed the preceding three decades of research in linguistics and concluded that God had actually gone much farther in confounding the language of Noah's descendants. Whereas the God of Genesis was said to be content with mere mutual unintelligibility, Joos declared that "lan-

guages could differ from each other without limit and in unpredictable ways." That same year, the Chomskyan revolution began with the publication of *Syntactic Structures*, and the next three decades took us back to the literal biblical account. According to Chomsky, a visiting Martian scientist would surely conclude that aside from their mutually unintelligible vocabularies, Earthlings speak a single language.

Even by the standards of theological debates, these interpretations are strikingly different. Where did they come from? The 4,000 to 6,000 languages of the planet do look impressively different from English and from one another. Here are the most conspicuous ways in which languages can differ from what we are used to in English:

1. English is an "isolating" language, which builds sentences by rearranging immutable word-sized units, like *Dog bites man* and *Man bites dog*. Other languages express who did what to whom by modifying nouns with case affixes, or by modifying the verb with affixes that agree with its role-players in number, gender, and person. One example is Latin, an "inflecting" language in which each affix contains several pieces of information; another is Kivunjo, an "agglutinating" language in which each affix conveys one piece of information and many affixes are strung together, as in the eight-part verb in Chapter 5.
2. English is a "fixed-word-order" language where each phrase has a fixed position. "Free-word-order" languages allow phrase order to vary. In an extreme case like the Australian aboriginal language Warlpiri, words from different phrases can be scrambled together: *This man speared a kangaroo* can be expressed as *Man this kangaroo speared*, *Man kangaroo speared this*, and any of the other four orders, all completely synonymous.
3. English is an "accusative" language, where the subject of an intransitive verb, like *she* in *She ran*, is treated identically to the subject of a transitive verb, like *she* in *She kissed Larry*, and different from the object of the transitive verb, like *her* in *Larry kissed her*. "Ergative" languages like Basque and many Australian languages have a different scheme for collapsing these three roles. The subject of an intransitive verb and the object of a transitive verb are identical, and the subject of the

transitive is the one that behaves differently. It is as if we were to say *Ran her* to mean "She ran."

4. English is a "subject-prominent" language in which all sentences must have a subject (even if there is nothing for the subject to refer to, as in *It is raining* or *There is a unicorn in the garden*). In "topic-prominent" languages like Japanese, sentences have a special position that is filled by the current topic of the conversation, as in *This place, planting wheat is good* or *California, climate is good*.
5. English is an "SVO" language, with the order subject-verb-object (*Dog bites man*). Japanese is subject-object-verb (SOV: *Dog man bites*); Modern Irish (Gaelic) is verb-subject-object (VSO: *Bites dog man*).
6. In English, a noun can name a thing in any construction: *a banana*; *two bananas*; *any banana*; *all the bananas*. In "classifier" languages, nouns fall into gender classes like human, animal, inanimate, one-dimensional, two-dimensional, cluster, tool, food, and so on. In many constructions, the name for the class, not the noun itself, must be used—for example, three hammers would be referred to as *three tools*; *to wit hammer*.

And, of course, a glance at a grammar for any particular language will reveal dozens or hundreds of idiosyncrasies.

On the other hand, one can also hear striking universals through the babble. In 1963 the linguist Joseph Greenberg examined a sample of 30 far-flung languages from five continents, including Serbian, Italian, Basque, Finnish, Swahili, Nubian, Masaai, Berber, Turkish, Hebrew, Hindi, Japanese, Burmese, Malay, Maori, Mayan, and Quechua (a descendant of the language of the Incas). Greenberg was not working in the Chomskyan school; he just wanted to see if any interesting properties of grammar could be found in all these languages. In his first investigation, which focused on the order of words and morphemes, he found no fewer than forty-five universals.

Since then, many other surveys have been conducted, involving scores of languages from every part of the world, and literally hundreds of universal patterns have been documented. Some hold absolutely. For example, no language forms questions by reversing the order of words within a sentence, like *Built Jack that house the this*

is? Some are statistical: subjects normally precede objects in almost all languages, and verbs and their objects tend to be adjacent. Thus most languages have SVO or SOV order; fewer have VSO; VOS and OVS are rare (less than 1%); and OSV may be nonexistent (there are a few candidates, but not all linguists agree that they are OSV). The largest number of universals involve implications: if a language has X, it will also have Y. We came across a typical example of an implicational universal in Chapter 4: if the basic order of a language is SOV, it will usually have question words at the end of the sentence, and postpositions; if it is SVO, it will have question words at the beginning, and prepositions. Universal implications are found in all aspects of language, from phonology (for instance, if a language has nasal vowels, it will have non-nasal vowels) to word meanings (if a language has a word for "purple," it will have a word for "red"; if a language has a word for "leg," it will have a word for "arm.")

If lists of universals show that languages do not vary freely, do they imply that languages are restricted by the structure of the brain? Not directly. First one must rule out two alternative explanations.

One possibility is that language originated only once, and all existing languages are the descendants of that proto-language and retain some of its features. These features would be similar across the languages for the same reason that alphabetical order is similar across the Hebrew, Greek, Roman, and Cyrillic alphabets. There is nothing special about alphabetical order; it was just the order that the Canaanites invented, and all Western alphabets came from theirs. No linguist accepts this as an explanation for language universals. For one thing, there can be radical breaks in language transmission across the generations, the most extreme being creolization, but universals hold of all languages including creoles. Moreover, simple logic shows that a universal implication, like "If a language has SVO order, then it has prepositions, but if it has SOV order, then it has postpositions," cannot be transmitted from parent to child the way words are. An implication, by its very logic, is not a fact about English: children could learn that English is SVO and has prepositions, but nothing could show them that if a language is SVO, then it must have prepositions. A universal implication is a fact about all languages, visible only from the vantage point of a comparative linguist. If a language changes from SOV to SVO over the course of history and its postpositions

flip to prepositions, there has to be some explanation of what keeps these two developments in sync.

Also, if universals were simply what is passed down through the generations, we would expect that the major differences between kinds of language should correlate with the branches of the linguistic family tree, just as the difference between two cultures generally correlates with how long ago they separated. As humanity's original language differentiated over time, some branches might become SOV and others SVO; within each of these branches some might have agglutinated words, others isolated words. But this is not so. Beyond a time depth of about a thousand years, history and typology often do not correlate well at all. Languages can change from grammatical type to type relatively quickly, and can cycle among a few types over and over; aside from vocabulary, they do not progressively differentiate and diverge. For example, English has changed from a free-word-order, highly inflected, topic-prominent language, as its sister German remains to this day, to a fixed-word-order, poorly inflected, subject-prominent language, all in less than a millennium. Many language families contain close to the full gamut of variations seen across the world in particular aspects of grammar. The absence of a strong correlation between the grammatical properties of languages and their place in the family tree of languages suggests that language universals are not just the properties that happen to have survived from the hypothetical mother of all languages.

The second counterexplanation that one must rule out before attributing a universal of language to a universal language instinct is that languages might reflect universals of thought or of mental information processing that are not specific to language. As we saw in Chapter 3, universals of color vocabulary probably come from universals of color vision. Perhaps subjects precede objects because the subject of an action verb denotes the causal agent (as in *Dog bites man*); putting the subject first mirrors the cause coming before the effect. Perhaps head-first or head-last ordering is consistent across all the phrases in a language because it enforces a consistent branching direction, right or left, in the language's phrase structure trees, avoiding difficult-to-understand onion constructions. For example, Japanese is SOV and has modifiers to the left; this gives it constructions like "modifier-SOV" with the modifier on the outside rather than "S-modifier OV" with the modifier embedded inside.

universals they do not work at all. For example, Greenberg noted that if a language has both derivational suffixes (which create new words from old ones) and inflectional suffixes (which modify a word to fit its role in the sentence), then the derivational suffixes are always closer to the stem than the inflectional ones. In Chapter 5 we saw this principle in English in the difference between the grammatical *Darwinisms* and the ungrammatical *Darwinsism*. It is hard to think of how this law could be a consequence of any universal principle of thought or memory: why would the concept of two ideologies based on one Darwin be thinkable, but the concept of one ideology based on two Darwins (say, Charles and Erasmus) not be thinkable (unless one reasons in a circle and declares that the mind must find *-ism* to be more cognitively basic than the plural, because that's the order we see in language)? And remember Peter Gordon's experiments showing that children say *mice-eater* but never *rats-eater*, despite the conceptual similarity of rats and mice and despite the absence of either kind of compound in parents' speech. His results corroborate the suggestion that this particular universal is caused by the way that morphological rules are computed in the brain, with inflection applying to the products of derivation but not vice versa.

In any case, Greenbergisms are not the best place to look for a neurologically given Universal Grammar that existed before Babel. It is the organization of grammar as a whole, not some laundry list of facts, that we should be looking at. Arguing about the possible causes of something like SVO order misses the forest for the trees. What is most striking of all is that we can look at a randomly picked language and find things that can sensibly be called subjects, objects, and verbs to begin with. After all, if we were asked to look for the order of subject, object, and verb in musical notation, or in the computer programming language FORTRAN, or in Morse code, or in arithmetic, we would protest that the very idea is nonsensical. It would be like assembling a representative collection of the world's cultures from the six continents and trying to survey the colors of their hockey team jerseys or the form of their harakiri rituals. We should be impressed, first and foremost, that research on universals of grammar is even possible!

When linguists claim to find the same kinds of linguistic gadgets in language after language, it is not just because they expect languages

to have subjects and so they label as a "subject" the first kind of phrase they see that resembles an English subject. Rather, if a linguist examining a language for the first time calls a phrase a "subject" using one criterion based on English subjects—say, denoting the agent role of action verbs—the linguist soon discovers that other criteria, like agreeing with the verb in person and number and occurring before the object, will be true of that phrase as well. It is these *correlations* among the properties of a linguistic thingamabob across languages that make it scientifically meaningful to talk about subjects and objects and nouns and verbs and auxiliaries and inflections—and not just Word Class #2,783 and Word Class #1,491—in languages from Abaza to Zyrian.

Chomsky's claim that from a Martian's-eye-view all humans speak a single language is based on the discovery that the same symbol-manipulating machinery, without exception, underlies the world's languages. Linguists have long known that the basic design features of language are found everywhere. Many were documented in 1960 by the non-Chomskyan linguist C. F. Hockett in a comparison between human languages and animal communication systems (Hockett was not acquainted with Martian). Languages use the mouth-to-ear channel as long as the users have intact hearing (manual and facial gestures, of course, are the substitute channel used by the deaf). A common grammatical code, neutral between production and comprehension, allows speakers to produce any linguistic message they can understand, and vice versa. Words have stable meanings, linked to them by arbitrary convention. Speech sounds are treated discontinuously; a sound that is acoustically halfway between *bat* and *pat* does not mean something halfway between batting and patting. Languages can convey meanings that are abstract and remote in time or space from the speaker. Linguistic forms are infinite in number, because they are created by a discrete combinatorial system. Languages all show a duality of patterning in which one rule system is used to order phonemes within morphemes, independent of meaning, and another is used to order morphemes within words and phrases, specifying their meaning.

Chomskyan linguistics, in combination with Greenbergian surveys, allows us to go well beyond this basic spec sheet. It is safe to say that the grammatical machinery we used for English in Chapters 4–6 is used in all the world's languages. 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 (INFL), 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. The phonological forms of words are defined by metrical and syllable trees and separate tiers of features like voicing, tone, and manner and place of articulation, and are subsequently adjusted by ordered phonological rules. Though many of these arrangements are in some sense useful, their details, found in language after language but not in any artificial system like FORTRAN or musical notation, give a strong impression that a Universal Grammar, not reducible to history or cognition, underlies the human language instinct.

God did not have to do much to confound the language of Noah's descendants. In addition to vocabulary—whether the word for "mouse" is *mouse* or *souris*—a few properties of language are simply not specified in Universal Grammar and can vary as parameters. For example, it is up to each language to choose whether the order of elements within a phrase is head-first or head-last (*eat sushi* and *to Chicago* versus *sushi eat* and *Chicago to*) and whether a subject is mandatory in all sentences or can be omitted when the speaker desires. Furthermore, a particular grammatical widget often does a great deal of important work in one language and hums away unobtrusively in the corner of another. The overall impression is that Universal Grammar is like an archetypal body plan found across vast numbers of animals in a phylum. For example, among all the amphibians, reptiles, birds, and mammals, there is a common body architecture, with a segmented backbone, four jointed limbs, a tail, a skull, and so

on. The various parts can be grotesquely distorted or stunted across animals: a bat's wing is a hand, a horse trots on its middle toes, whales' forelimbs have become flippers and their hindlimbs have shrunk to invisible nubs, and the tiny hammer, anvil, and stirrup of the mammalian middle ear are jaw parts of reptiles. But from newts to elephants, a common topology of the body plan—the shin bone connected to the thigh bone, the thigh bone connected to the hip bone—can be discerned. Many of the differences are caused by minor variations in the relative timing and rate of growth of the parts during embryonic development. Differences among languages are similar. There seems to be a common plan of syntactic, morphological, and phonological rules and principles, with a small set of varying parameters, like a checklist of options. Once set, a parameter can have far-reaching changes on the superficial appearance of the language.

If there is a single plan just beneath the surfaces of the world's languages, then any basic property of one language should be found in all the others. Let's reexamine the six supposedly un-English language traits that opened the chapter. A closer look shows that all of them can be found right here in English, and that the supposedly distinctive traits of English can be found in the other languages.

1. English, like the inflecting languages it supposedly differs from, has an agreement marker, the third person singular *s* in *He walks*. It also has case distinctions in the pronouns, such as *he* versus *him*. And like agglutinating languages, it has machinery that can glue many bits together into a long word, like the derivational rules and affixes that create *sensationalization* and *Darwinianisms*. Chinese is supposed to be an even more extreme example of an isolating language than English, but it, too, contains rules that create multipart words such as compounds and derivatives.
2. English, like free-word-order languages, has free ordering in strings of prepositional phrases, where each preposition marks the semantic role of its noun phrase as if it were a case marker: *The package was sent from Chicago to Boston by Mary*; *The package was sent by Mary to Boston from Chicago*; *The package was sent to Boston from Chicago by Mary*, and so on. Conversely, in so-called scrambling languages at the other extreme,

WHILE WORD ORDER IS NEVER COMPLETELY FREE; auxiliaries, for example, must go in the second position in a sentence, which is rather like their positioning in English.

3. English, like ergative languages, marks a similarity between the objects of transitive verbs and the subjects of intransitive verbs. Just compare *John broke the glass* (*glass* = object) with *The glass broke* (*glass* = subject of intransitive), or *Three men arrived* with *There arrived three men*.
4. English, like topic-prominent languages, has a topic constituent in constructions like *As for fish, I eat salmon* and *John I never really liked*.
5. Like SOV languages, not too long ago English availed itself of an SOV order, which is still interpretable in archaic expressions like *Till death do us part* and *With this ring I thee wed*.
6. Like classifier languages, English insists upon classifiers for many nouns: you can't refer to a single square as *a paper* but must say *a sheet of paper*. Similarly, English speakers say *a piece of fruit* (which refers to an apple, not a piece of an apple), *a blade of grass*, *a stick of wood*, *fifty head of cattle*, and so on.



If a Martian scientist concludes that humans speak a single language, that scientist might well wonder why Earthspeak has those thousands of mutually unintelligible dialects (assuming that the Martian has not read Genesis 11; perhaps Mars is beyond the reach of the Gideon Society). If the basic plan of language is innate and fixed across the species, why not the whole banana? Why the head-first parameter, the different-sized color vocabularies, the Boston accent?

Terrestrial scientists have no conclusive answer. The theoretical physicist Freeman Dyson proposed that linguistic diversity is here for a reason: "it was nature's way to make it possible for us to evolve rapidly," by creating isolated ethnic groups in which undiluted biological and cultural evolution can proceed swiftly. But Dyson's evolutionary reasoning is defective. Lacking foresight, lineages try to be the best that they can be, *now*; they do not initiate change for change's sake on the chance that one of the changes might come in handy in some ice age ten thousand years in the future. Dyson is not the first to ascribe a purpose to linguistic diversity. A Colombian Bará Indian, a member of an outbreeding set of tribes, when asked by a linguist

why there were so many languages, explained, "If we were all Tukan speakers, where would we get our women?"

As a native of Quebec, I can testify that differences in language lead to differences in ethnic identification, with widespread effects, good and bad. But the suggestions of Dyson and the Bará put the causal arrow backwards. Surely head-first parameters and all the rest represent massive overkill in some design to distinguish among ethnic groups, assuming that that was even evolutionarily desirable. Humans are ingenious at sniffing out minor differences to figure out whom they should despise. All it takes is that European-Americans have light skin and African-Americans have dark skin, that Hindus make a point of not eating beef and Moslems make a point of not eating pork, or, in the Dr. Seuss story, that the Star-Bellied Sneetches have bellies with stars and the Plain-Bellied Sneetches have none upon theirs. Once there is more than one language, ethnocentrism can do the rest; we need to understand why there is more than one language.

Darwin himself expressed the key insight:

The formation of different languages and of distinct species, and the proofs that both have been developed through a gradual process, are curiously parallel. . . . We find in distinct languages striking homologies due to community of descent, and analogies due to a similar process of formation. . . . Languages, like organic beings, can be classed in groups under groups; and they can be classed either naturally, according to descent, or artificially by other characters. Dominant languages and dialects spread widely, and lead to the gradual extinction of other tongues. A language, like a species, when extinct, never . . . reappears.

That is, English is similar though not identical to German for the same reason that foxes are similar though not identical to wolves: English and German are modifications of a common ancestor language spoken in the past, and foxes and wolves are modifications of a common ancestor species that lived in the past. Indeed, Darwin claimed to have taken some of his ideas about biological evolution from the linguistics of his time, which we will encounter later in this chapter.

Differences among languages, like differences among species, are the effects of three processes acting over long spans of time. One



process is variation—mutation, in the case of species; linguistic innovation, in the case of languages. The second is heredity, so that descendants resemble their progenitors in these variations—genetic inheritance, in the case of species; the ability to learn, in the case of languages. The third is isolation—by geography, breeding season, or reproductive anatomy, in the case of species; by migration or social barriers, in the case of languages. In both cases, isolated populations accumulate separate sets of variations and hence diverge over time. To understand why there is more than one language, then, we must understand the effects of innovation, learning, and migration.



Let me begin with the ability to learn, and by convincing you that there is something to explain. Many social scientists believe that learning is some pinnacle of evolution that humans have scaled from the lowlands of instinct, so that our ability to learn can be explained by our exalted braininess. But biology says otherwise. Learning is found in organisms as simple as bacteria, and, as James and Chomsky pointed out, human intelligence may depend on our having *more* innate instincts, not fewer. Learning is an option, like camouflage or horns, that nature gives organisms as needed—when some aspect of the organisms' environmental niche is so unpredictable that anticipation of its contingencies cannot be wired in. For example, birds that nest on small cliff ledges do not learn to recognize their offspring. They do not need to, for any blob of the right size and shape in their nest is sure to be one. Birds that nest in large colonies, in contrast, are in danger of feeding some neighbor's offspring that sneaks in, and they have evolved a mechanism that allows them to learn the particular nuances of their own babies.

Even when a trait starts off as a product of learning, it does not have to remain so. Evolutionary theory, supported by computer simulations, has shown that when an environment is stable, there is a selective pressure for learned abilities to become increasingly innate. That is because if an ability is innate, it can be deployed earlier in the lifespan of the creature, and there is less of a chance that an unlucky creature will miss out on the experiences that would have been necessary to teach it.

Why might it pay for the child to learn parts of a language rather than having the whole system hard-wired? For vocabulary, the bene-

fits are fairly obvious: 60,000 words might be too many to evolve, store, and maintain in a genome comprising only 50,000 to 100,000 genes. And words for new plants, animals, tools, and especially people are needed throughout the lifespan. But what good is it to learn different grammars? No one knows, but here are some plausible hypotheses.

Perhaps some of the things about language that we have to learn are easily learned by simple mechanisms that antedated the evolution of grammar. For example, a simple kind of learning circuit might suffice to record which element comes before which other one, as long as the elements are first defined and identified by some other cognitive module. If a universal grammar module defines a head and a role-player, their relative ordering (head-first or head-last) could thus be recorded easily. If so, evolution, having made the basic computational units of language innate, may have seen no need to replace every bit of learned information with innate wiring. Computer simulations of evolution show that the pressure to replace learned neural connections with innate ones diminishes as more and more of the network becomes innate, because it becomes less and less likely that learning will fail for the rest.

A second reason for language to be partly learned is that language inherently involves sharing a code with other people. An innate grammar is useless if you are the only one possessing it: it is a tango of one, the sound of one hand clapping. But the genomes of other people mutate and drift and recombine when they have children. Rather than selecting for a completely innate grammar, which would soon fall out of register with everyone else's, evolution may have given children an ability to learn the variable parts of language as a way of synchronizing their grammars with that of the community.



The second component of language differentiation is a source of variation. Some person, somewhere, must begin to speak differently from the neighbors, and the innovation must spread and catch on like a contagious disease until it becomes epidemic, at which point children perpetuate it. Change can arise from many sources. Words are coined, borrowed from other languages, stretched in meaning, and forgotten. New jargon or speech styles may sound way cool within some subculture and then infiltrate the mainstream. Specific examples

of these borrowings are a subject of fascination to pop language fanciers and fill many books and columns. Personally, I have trouble getting excited. Should we really be astounded to learn that English borrowed *kimono* from Japanese, *banana* from Spanish, *moccasin* from the American Indians, and so on?

Because of the language instinct, there is something much more fascinating about linguistic innovation: each link in the chain of language transmission is a human brain. That brain is equipped with a universal grammar and is always on the lookout for examples in ambient speech of various kinds of rules. Because speech can be sloppy and words and sentences ambiguous, people are occasionally apt to *reanalyze* the speech they hear—they interpret it as having come from a different dictionary entry or rule than the ones that the speaker actually used.

A simple example is the word *orange*. Originally it was *norange*, borrowed from the Spanish *naranja*. But at some point some unknown creative speaker must have reanalyzed a *norange* as an *orange*. Though the speaker's and hearer's analyses specify identical sounds for that particular phrase, *anorange*, once the hearer uses the rest of grammar creatively, the change becomes audible, as in *those oranges* rather than *those noranges*. (This particular change has been common in English. Shakespeare used *nuncle* as an affectionate name, a recutting of *mine Uncle* to *my nuncle*, and *Ned* came from *Edward* by a similar route. Nowadays many people talk about a *whole nother thing*, and I know of a child who eats *ectarines* and an adult called *Nalice* who refers to people she doesn't care for as *nidiots*.)

Reanalysis, a product of the discrete combinatorial creativity of the language instinct, partly spoils the analogy between language change on the one hand and biological and cultural evolution on the other. Many linguistic innovations are not like random mutation, drift, erosion, or borrowing. They are more like legends or jokes that are embellished or improved or reworked with each retelling. That is why, although grammars change quickly through history, they do not degenerate, for reanalysis is an inexhaustible source of new complexity. Nor must they progressively differentiate, for grammars can hop among the grooves made available by the universal grammar in everyone's mind. Moreover, one change in a language can cause an imbalance that can trigger a cascade of other changes elsewhere, like falling dominoes. Any part of language can change:

• Many phonological rules arose when hearers in some community reanalyzed rapid, coarticulated speech. Imagine a dialect that lacks the rule that converts *t* to a flapped *d* in *utter*. Its speakers generally pronounce the *t* as a *t*, but may not do so when speaking rapidly or affecting a casual "lazy" style. Hearers may then credit them with a flapping rule, and they (or their children) would then pronounce the *t* as a flap even in careful speech. Taken further, even the underlying phonemes can be reanalyzed. This is how we got *v*. Old English didn't have a *v*; our word *starve* was originally *steorfan*. But any *f* between two vowels was pronounced with voicing turned on, so *ofer* was pronounced "over," thanks to a rule similar to the contemporary flapping rule. Listeners eventually analyzed the *v* as a separate phoneme, rather than as a pronunciation of *f*, so now the word actually is *over*, and *v* and *f* are available as separate phonemes. For example, we can now differentiate words like *waver* and *wafer*, but King Arthur could not have.

• The phonological rules governing the *pronunciation* of words can, in turn, be reanalyzed into morphological rules governing the *construction* of them. Germanic languages like Old English had an "umlaut" rule that changed a back vowel to a front vowel if the next syllable contained a high front vowel sound. For example, in *foeti*, the plural of "foot," the back *a* was altered by the rule to a front *e*, harmonizing with the front *i*. Subsequently the *i* at the end ceased being pronounced, and because the phonological rule no longer had anything to trigger it, speakers reinterpreted the *o-e* shift as a morphological relationship signaling the plural—resulting in our *foot-feet*, *mouse-mice*, *goose-geese*, *tooth-teeth*, and *louse-lice*.

• Reanalysis can also take two variants of one word, one created from the other by an inflectional rule, and recategorize them as separate words. The speakers of yesteryear might have noticed that an inflectional *oo-ee* rule applies not to all items but only to a few: *tooth-teeth*, but not *booth-beeth*. So *teeth* was interpreted as a separate, irregular word linked to *tooth*, rather than the product of a rule applied to *tooth*. The vowel change no longer acts like a rule—hence Lederer's humorous story "Foxen in the Henhice." Other sets of vaguely related words came into English by this route, like *brother-brethren*, *half-halve*, *teeth-teethe*, *to fall-to fell*, *to rise-to raise*; even *wrought*, which used to be the past tense of *work*.

• Other morphological rules can be formed when the words that

commonly accompany some other word get eroded and then glued onto it. Tense markers may come from auxiliaries; for example, as I've mentioned, the English *-ed* suffix may have evolved from *did*: *hammer-did* → *hammered*. Case markers may come from slurred prepositions or from sequences of verbs (for example, in a language that allows the construction *take nail hit it*, *take* might erode into an accusative case marker like *ta-*). Agreement markers can arise from pronouns: in *John, he kissed her*, *he* and *her* can eventually glom onto the verb as agreement affixes.

• Syntactic constructions can arise when a word order that is merely preferred becomes reanalyzed as obligatory. For example, when English had case markers, both *give him a book* and *give a book him* were possible, but the former was more common. When the case markers eroded in casual speech, many sentences would have become ambiguous if order were still allowed to vary. The more common order was thus enshrined as a rule of syntax. Other constructions can arise from multiple reanalyses. The English perfect *I had written a book* originally came from *I had a book written* (meaning "I owned a book that was written"). The reanalysis was inviting because the SOV pattern was alive in English; the participle *written* could be reanalyzed as the main verb of the sentence, and *had* could be reanalyzed as its auxiliary, begetting a new analysis with a related meaning.



The third ingredient for language splitting is separation among groups of speakers, so that successful innovations do not take over everywhere but accumulate separately in the different groups. Though people modify their language every generation, the extent of these changes is slight: vastly more sounds are preserved than mutated, more constructions analyzed properly than reanalyzed. Because of this overall conservatism, some patterns of vocabulary, sound, and grammar survive for millennia. They serve as the fossilized tracks of mass migrations in the remote past, clues to how human beings spread out over the earth to end up where we find them today.

How far back can we trace the language of this book, modern American English? Surprisingly far, perhaps five or even nine thousand years. Our knowledge of where our language has come from is considerably more precise than the recollection of Dave Barry's Mr. Language Person: "The English language is a rich verbal tapestry

woven together from the tongues of the Greeks, the Latins, the Angles, the Klaxtons, the Celts, and many more other ancient peoples, all of whom had severe drinking problems." Let's work our way back.

America and England first came to be divided by a common language, in Wilde's memorable words, when colonists and immigrants isolated themselves from British speech by crossing the Atlantic Ocean. England was already a Babel of regional and class dialects when the first colonists left. What was to become the standard American dialect was seeded by the ambitious or dissatisfied members of lower and middle classes from southeastern England. By the eighteenth century an American accent was noted, and pronunciation in the American South was particularly influenced by the immigration of the Ulster Scots. Westward expansions preserved the layers of dialects of the eastern seaboard, though the farther west the pioneers went, the more their dialects mixed, especially in California, which required leapfrogging of the vast interior desert. Because of immigration, mobility, literacy, and now the mass media, the English of the United States, even with its rich regional differences, is homogeneous compared with the languages in territories of similar size in the rest of the world; the process has been called "Babel in reverse." It is often said that the dialects of the Ozarks and Appalachia are a relict of Elizabethan English, but this is just a quaint myth, coming from the misconception of language as a cultural artifact. We think of the folk ballads, the hand-stitched quilts, and the whiskey aging slowly in oak casks and easily swallow the rumor that in this land that time forgot, the people still speak the traditional tongue lovingly handed down through the generations. But language does not work that way—at all times, in all communities, language changes, though the various parts of a language may change in different ways in different communities. Thus it is true that these dialects preserve some English forms that are rare elsewhere, such as *afeared*, *yourn*, *bism*, and *et*, *holp*, and *clome* as the past of *eat*, *help*, and *climb*. But so does every variety of American English, including the standard one. Many so-called Americanisms were in fact carried over from England, where they were subsequently lost. For example, the participle *gotten*, the pronunciation of *a* in *path* and *bath* with a front-of-the-mouth "a" rather than the back-of-the-mouth "ah," and the use of *mad* to mean "angry," *fall* to mean "autumn," and *sick* to mean "ill," strike the