

Human language as a unique form of communication

# In the Beginning Was the Sentence



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**What is it that makes us speak the kind of language that we do? Why do some people have trouble learning to use it? Where does language come from?**

All living organisms communicate for survival and reproduction, by sharing information about food (such as the famous waggle dance, used by bees to exchange information about the location, distance, and quality of food resources) and threats (the sounds that velvet monkeys emit to warn of a threat coming from the sky, such as a hawk, differ from those made in response to a threat on land, for example an approaching leopard). Such behavior is innate to both senders and recipients of such messages. But we know that animals can be trained to produce many new reactions to various signals. In addition, they can memorize the meaning of different signs from their surroundings. Human beings also have many analogous innate and learned mechanisms

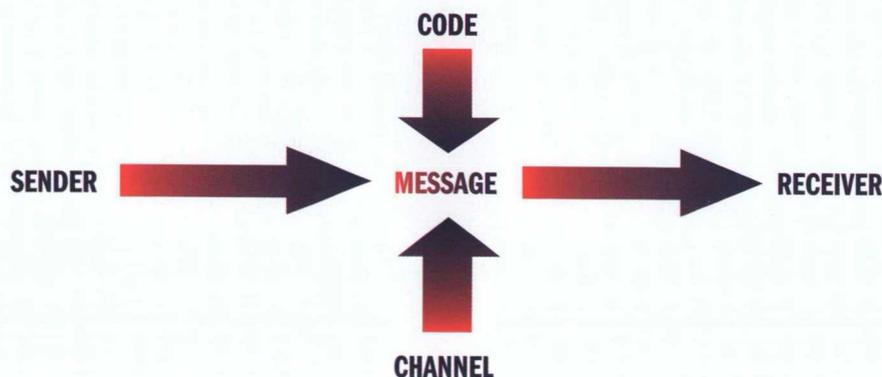
for communicating with their physical and above all social environment.

## Where does language come from?

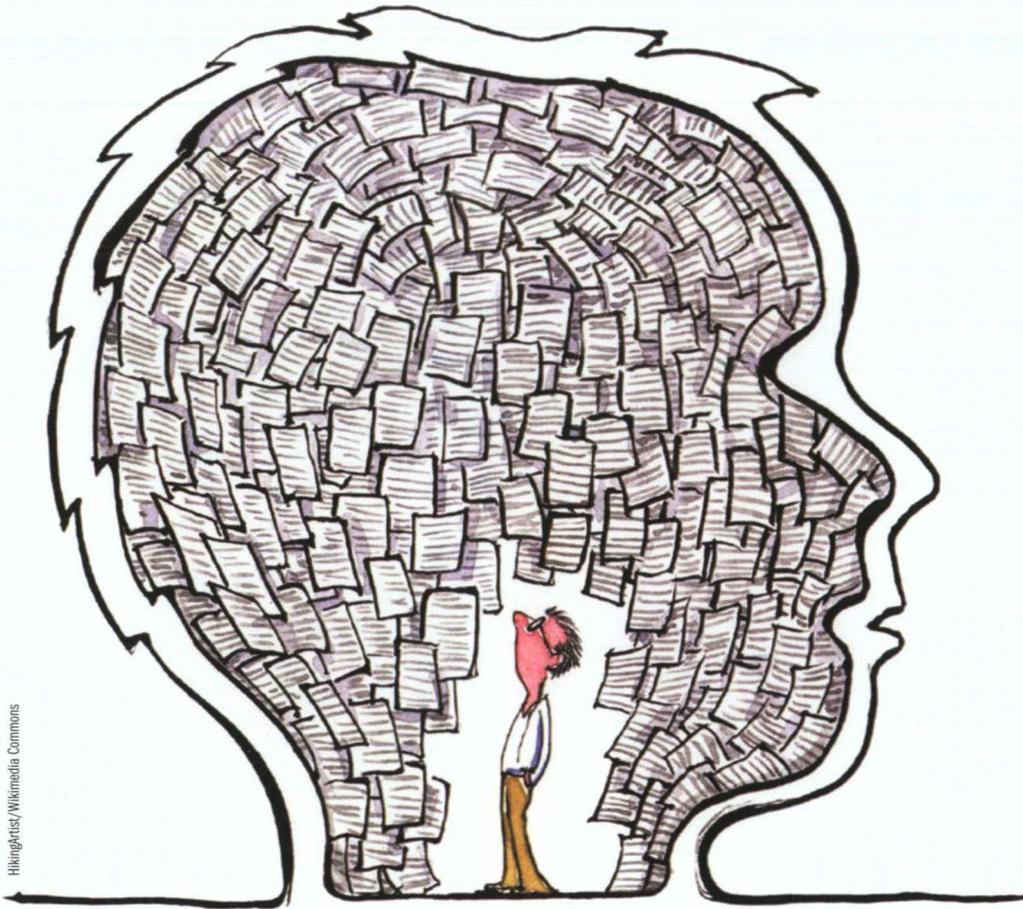
The model of communication developed in 1949 by Claude Shannon and Warren Weaver is comprised of several concepts: the message, its sender and receiver, and the code, which is also the source of the message, along with the channel, which allows the transmissions of the message from the sender to the receiver.

One crucial element of this model is the concept of code. Human language is the only natural code of communication which is characterized by double articulation. The first level consists of a finite set of around 100 possible sounds of speech called phonemes (each language uses around 20-30 phonemes). In isolation, phonemes do not have meaning. When joined together, they create meaningful units of language, namely morphemes and words. Their exact number varies and may exceed 100,000, depending on the language. At the second level of articulation, grammatical rules are employed to combine these units into meaningful sentences (as opposed to random combinations). Theoretically, every language has an infinite number of sentences.

Double articulation is unique to human language: animal languages have only one level of articulation. Simply put, they consist of a certain number of signs that have certain meanings, sometimes quite precise ones,



A schematic diagram of communication



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Universal grammar is based on the assumption that every human being has a mental lexicon composed of words, which are transformed into sentences through generative rules. Transformational rules, in turn, serve to change these sentences into other sentences (for example, from affirmative to negative, or from active to passive)

such as the aforementioned sounds emitted by velvet monkeys. But people can even create artificial languages, such as the language of logic and programming languages.

Natural human language, therefore, is the innate capacity of every human child to acquire any of the around 6,000 languages spoken on Earth just by coming into contact with individuals who speak it, a situation referred to as “poverty of the stimulus.” Conscious efforts made by parents to teach their children to speak are surely not harmful, but are not really indispensable (such efforts are only needed to master reading and writing skills).

Many scholars - linguists, psychologists, sociologists, philosophers, and neuroscientists - are interested in the nature of this capacity. In my opinion, an important notion here is that of universal grammar (UG), a concept introduced by Noam Chomsky, who developed the theory of transformational-generative grammar in linguistics. Universal grammar is based on the assumption that every human being has a mental lexicon composed of words, which are transformed into sentences by generative rules. Transformational rules, in turn, serve to

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### The mysteries of SLI

There are several arguments in favor of the innate nature of universal grammar. First of all, a child learns a language very fast, without being hindered by any disturbances. Another argument is the location of the language center in Broca’s and Wernicke’s areas in the brain. Finally, there is a third argument: the existence of specific language impairment (SLI), diagnosed in children who have difficulties learning the kind of morphological and syntactical rules that are present in every language.

Let us pause for a moment to look at this latter argument. The theory of universal grammar has come under criticism for various reasons, one of them being the domain-specificity of the language faculty so conceived. It was once thought, to the contrary, that the capacity for language could be ensured by general cognitive processing properties (such as the sense of hearing) and memory, especially working memory; in children with

SLI, then, this processing proves to be too slow to handle rapidly changing information in the reception of language stimuli. However, studies conducted by Heather van der Lely et al. (2004) demonstrated that children with SLI (which affects around 5% of every human population) generally exhibited no hearing difficulties and differed from their peers not in terms of the speed of processing non-speech sounds, but only in terms of the difficulties they had in acquiring grammatical rules. Normal language acquisition is characterized by overgeneralization: a child initially applies a newly-acquired rule even to exceptions (for example, an English speaking child will say "I goed" instead of "I went" after it learns the regular past tense ending "-ed"). A child with SLI puts equal effort into learning both regular forms and exceptions. The authors of these studies therefore proposed the term G(SLI), since this effect pertained to grammar, not to other domains of language.

An issue of particular interest in the neuroanatomy of speech and language is the role of the gene FOXP2, discovered in 2001 (Lai et al.) and referred to as the language gene. A mutation of FOXP2 was observed in a family whose members exhibited a hereditary form of SLI. FOXP2 also occurs in many other animals, coordinating sequential muscle movements (including the facial muscles). Its role in language and speech is currently an intensively studied topic.

Interestingly, SLI can also be found in deaf people learning sign languages, the structure of which is analogous to that of spoken languages. Studies show that the proportion of individuals with SLI is the same among deaf users of British Sign Language as among the hearing population (5%). Around 3.5% members of every population are born deaf. These findings indicate that the mental language faculty is independent of the particular organs responsible for speech reception and production.

The use of term "universal grammar" as a description of the faculty of language has sparked off numerous reservations. Some scholars believe that the word "universal" wrongly suggests that grammatical rules are the same for all languages. Consequently, other terms have been proposed to replace it: functional, cognitive, and natural. Personally, I prefer the term "universal," which reflects Ray Jackendoff's approach to grammar as a toolkit from which

every language chooses the tools it finds suitable, which users of that language must then apply (for example, the past tense in the Polish language reflects the gender of the speaker, a differentiation that is not necessary in English).

### The case of the macaque

Let us ponder the question of language functions. Two are obvious: communicative, discussed at the beginning of this article, and representative, which means reference to an external or internal reality. Some authors (such as Chomsky) treat communication as a side effect of the referential function of language. However, it would appear that language emerged to help people communicate, yet proved an effective instrument for thinking and devising new meanings.

Communication is therefore a superordinate notion: it requires no language and may occur in the context of body language and pantomime. The foundations of our ability to communicate should therefore be placed outside the language faculty. Psychologists operate within this context to examine various abilities of human beings, such as decentrization (the ability to adopt the perspective of another person), intersubjectivity, social intelligence, and emotional intelligence. In this article, I shall use the term "theory of mind," introduced by David Premack and Guy Woodruff (1978), to describe the innate ability to understand one's own intentions and the intentions of other individuals.

Over the past decade or so, theory of mind has been confirmed by the discovery of mirror neurons, which may be seen as a neurophysiological basis for this capacity. Their discovery came largely by chance. Scientists from a laboratory in Parma led by Giacomo Rizzolatti placed electrodes in the neurons located in the premotor cortex of a macaque monkey, which presumably controlled the neurons in the motor cortex responsible for such actions as grasping an item. It turned out that the neurons fired not only when the macaque intended to perform a certain action but also when it saw this action being performed by someone else. Hence the name "mirror neurons." Such neurons have also been found in chimpanzees and in humans in Broca's area; damage to this area causes an aphasia in users of both sound languages and sign languages.

**A model of linguistic knowledge**

	<b>Descriptive unit</b>	<b>Biological foundations (tacit component)</b>	<b>Social conditioning (explicit component)</b>	<b>Functions</b>	<b>Disorders</b>
<b>Language competence</b>	<b>SENTENCE</b>	<b>UNIVERSAL GRAMMAR</b>	<b>METAPRAGMATIC KNOWLEDGE</b>	<b>REPRESENTATIONAL</b>	<b>SLI</b>
<b>Communicative competence</b>	<b>UTTERANCE</b>	<b>THEORY OF MIND</b>	<b>METALINGUISTIC KNOWLEDGE</b>	<b>COMMUNICATIVE</b>	<b>AUTISM</b>

Theory of mind may manifest itself in emphatic behavior as well as tactics used by various fraudsters. It underlies the communicative competence (a term coined by Dell Hymes), or the ability to act and use language appropriately, depending on the listener and the social situation. An autistic person is deprived of such skills, so autism may be treated as a theory-of-mind disorder. Communicative competence manifests itself in utterances that convey not only judgments but also intentions (the purpose of saying something). Such utterances include various types of speech acts. According to the classification proposed by John Austin and John Searle, these include assertives, directives (questions, requests, orders), commissives, expressives (wishes, congratulations, condolences), and declarations, which may change the reality, such as a court verdict and a marriage ceremony.

The basic unit of strictly linguistic competence is simply a sentence, generated according to relevant rules, containing an underlying judgment about reality. Such strictly linguistic competence may be found in individuals diagnosed with autism, for example Christopher, a boy studied by Neal Smith and Ianthi-Maria Tsimpli (1995), who knew a dozen or so languages and could translate sentences, but could not use them in actual communication, for example he could not understand metaphors and jokes, which require the use of communicative competence.

**A model of language knowledge**

All these deliberations can be presented in the form of a model of language knowledge (Kurcz, 2005, 2011, see chart above). One element of this model that still needs to be explained is the “social conditioning” field. Language acquisition occurs early in life. It is a tacit process that engages chiefly procedural memory. In the course of conscious learning, for example during school education, we learn such notions as grammatical terms. This is part of metalinguistic knowledge, like the knowledge about language and its structure, and metapragmatic knowledge, or knowledge about what behavior is appropriate in different social situations, for example in church, at lectures, and at dinner parties, all of which can be broadly defined as *savoir vivre*.

Language has allowed man not only to dominate the world but also to explain and describe it. The structure of these stories, which represent the essence of human life, was described by Jonathan Gottschall in the book *The Storytelling Animal: How Stories Make us Human* (2013). ■

**Further reading:**

- Chomsky N. (1965). *Aspects of the Theory of Syntax*. Cambridge MA: MIT Press
- Kurcz, I. (2005). *Psychologia języka i komunikacji* [Psychology of Language and Communication]. Warsaw: Scholar.
- Kurcz I., Okuniewska H. (eds.) (2011). *Język jako przedmiot badań psychologicznych* [Language as a Subject of Psychological Research]. Warsaw: Academica.