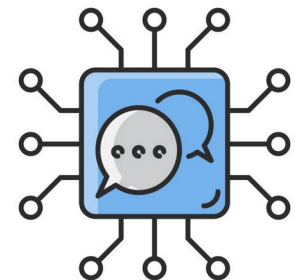


Anatomy of Language

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Language



Language

- Language is a structured system of communication. The structure of a language is its **grammar** and the free components are its **vocabulary**.
- Languages are the primary means of communication of humans, and can be conveyed through spoken, sign, or written language.
- Many languages, including the most widely-spoken ones, have writing systems that enable sounds or signs to be recorded for later reactivation.
- Human language is not dependent on a single mode of transmission (sight, sound, etc.) and is highly variable between cultures and across time.

Language

- Estimates of the number of human languages in the world vary between 5,000 and 7,000. Precise estimates depend on an arbitrary distinction (dichotomy) being established between languages and dialects.
- Natural languages are spoken, signed, or both; however, any language can be encoded into secondary media using auditory, visual, or tactile stimuli – for example, writing, whistling, signing, or braille.
- In other words, human language is modality-independent, but written or signed language is the way to inscribe or encode the natural human speech or gestures.

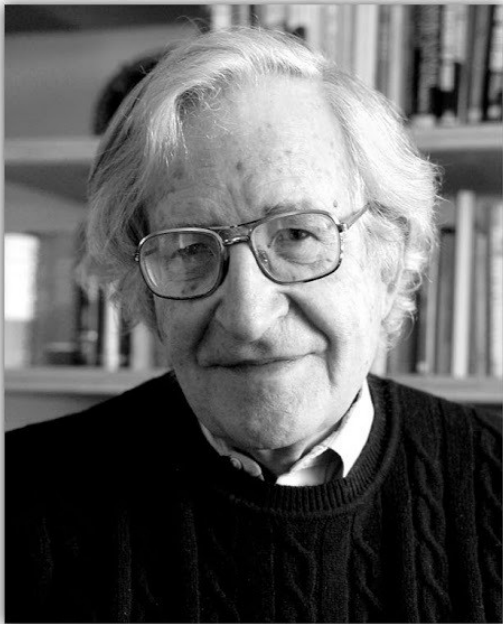
Early Languages

- The formal study of language is often considered to have started in India with Pāṇini, the 5th century BC grammarian who formulated 3,959 rules of Sanskrit morphology.
- However, Sumerian scribes already studied the differences between Sumerian and Akkadian grammar around 1900 BC.
- Subsequent grammatical traditions developed in all of the ancient cultures that adopted writing.

Modern Linguistics

- In the 1960s, Noam Chomsky formulated the generative theory of language.
- According to this theory, the most basic form of language is a set of syntactic rules that is universal for all humans and which underlies the grammars of all human languages.
- This set of rules is called Universal Grammar; for Chomsky, describing it is the primary objective of the discipline of linguistics.
- Thus, he considered that the grammars of individual languages are only of importance to linguistics insofar as they allow us to deduce the universal underlying rules from which the observable linguistic variability is generated.

Modern Linguistics



“Language is a process of free creation; its laws and principles are fixed, but the manner in which the principles of generation are used is free and infinitely varied. Even the interpretation and use of words involves a process of free creation.

~ Noam Chomsky

Language as a phenomenon

- Language is considered as a social phenomenon because all human beings communicate with their respective speech communities using the language they speak.
- That through language, day-to-day interactions are possible, it is with the help of language interpersonal relations are possible.
- Language is a social phenomenon. Language only exists in society. It is a means of nourishing and developing culture and establishing human relations.

Spoken Language

- Spoken language is the language we speak. It is often spontaneous and transient.
- Spoken language is used for interactions; the two speakers or the listener and the speaker are often in the same place. Thus, they can correct any mistake they make and change their utterances as they go along.
- With the exception of scripted speeches, spoken language tends to be full of incomplete sentences, repetitions, interruptions, and corrections.


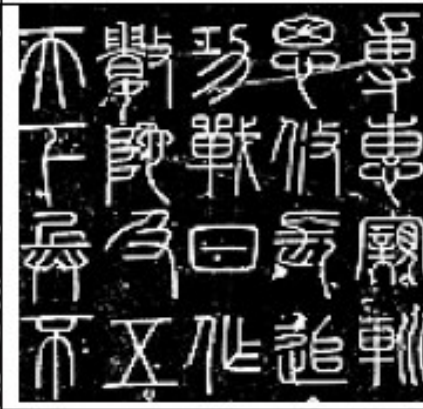


Spoken Language

- Speakers also use gestures, tone, pitch, volume, etc. to create additional meaning in spoken language.
- Unless the conversation is recorded, there is no record of the spoken language conversation that took place.
- Some forms and informal grammatical structures are also specific to spoken language.
- For example, words and phrases like 'my bad', 'y'know', 'busted,' 'ain't' etc. which are sometimes used in spoken language, are rarely used in written language.

Written Language

- Written language is the language we use to write.
- The main two language skills used in written language is reading and writing skills.
- Written language is not transient like spoken language; it tends to be permanent since there are written records of it.
- Once you have written something, it is not very easy to change it.

Written Language

Egypt Hieroglyph	Chinese Character	Indus Script	Sumer Cuneiform
			

Written Language

- Another interesting thing about written language is that the reader and writer are usually communicating across time and space, unlike in spoken language.
- Written language is typically more formal, complex and intricate than spoken language. It may contain longer sentences in complex tenses.
- However, some forms of written language like instant messages and informal letters are closer to spoken language.
- Written language can make use of features like punctuation, headings, layouts, colors, etc. to make a message clearer. Since written language does not receive immediate feedback, it should be very clear and unambiguous.

Spoken vs. Written Language

- Skills
 - Spoken Language involves speaking and listening skills.
 - Written Language involves reading and writing skills.
- Age
 - Spoken Language is older than written language.
 - Written Language is not as old as the spoken language.

Spoken vs. Written Language

- Complexity
 - Spoken Language is more informal and simple than written language.
 - Written Language is more formal and complex than spoken language.
- Users
 - Spoken Language is mostly used between two people who are in the same place.
 - Written Language promotes communication across space and time.

Spoken vs. Written Language

- Components
 - Spoken Language can use tone, pitch, volume, etc.
 - Written Language can use heading, punctuation, layouts, etc.
- Records
 - Spoken Language is temporary since there are no records.
 - Written Language is permanent since there are records.

Spoken vs. Written Language

- Features
 - Spoken Language contains repetitions, incomplete sentences, interruptions, corrections, etc.
 - Written Language is often grammatically correct and may contain long sentences in complex tenses.

Spoken vs. Written Language

Spoken

Spoken Language involves speaking and listening skills

Older than written language

More informal and simple than written language

Mostly used between two people who are in the same place

Written

Written Language involves reading and writing skills

Not as old as the spoken language

More formal and complex than spoken language

Promotes communication across space and time

Can use tone, pitch, volume, etc.

Temporary since there are no records

Contains repetitions, incomplete sentences, interruptions, corrections, etc.

Can use heading, punctuation, layouts, etc.

Permanent since there are records

Often grammatically correct and may contain long sentences in complex tenses

Semantics

- Language exists to be meaningful; the study of meaning, both in general theoretical terms and in reference to a specific language, is known as semantics.
- Semantics embraces the **meaningful functions** of phonological features, such as intonation, and of grammatical structures and the meanings of individual words.
- It is this last domain, the lexicon, that forms much of the subject matter of semantics.

Language Variants

- The word language contains a multiplicity of different designations.
- Two senses have already been distinguished: language as a universal species-specific capability of the human race and languages as the various manifestations of that capability, as with English, French, Latin, Swahili, Malay, Marathi and so on.

Physiological and physical basis

- In societies in which literacy is all but universal and language teaching at school begins with reading and writing in the native tongue, one is apt to think of language as a writing system that may be pronounced.
- In point of fact, language generally begins as a system of spoken communication that may be represented in various ways in writing.

Physiological and physical basis

- The human being has almost certainly been in some sense a speaking animal from early in the emergence of Homo sapiens as a recognizably distinct species.
- The earliest known systems of writing go back perhaps 4,000 to 5,000 years.
- This means that for many years (perhaps hundreds of thousands) human languages were transmitted from generation to generation and were developed entirely as spoken means of communication.

Speech Production

- Speaking is in essence the by-product of a necessary bodily process, the expulsion from the lungs of air charged with carbon dioxide after it has fulfilled its function in respiration.
- Most of the time one breathes out silently, but it is possible, by adopting various postures and by making various movements within the vocal tract, to interfere with the regressive airstream so as to generate noises of different sorts.

Language Acquisition

- In regard to the production of speech sounds, all typical humans are physiologically alike. It has been shown repeatedly that children learn the language of those who bring them up from infancy.
- These are often the biological parents, but one's first language is acquired from environment and learning, not from physiological inheritance.
- Adopted infants, whatever their physical characteristics and whatever the language of their biological parents, acquire the language of the adoptive parents.

Meaning and Style in Language

- The whole object and purpose of language is to be meaningful. Languages have developed and are constituted in their present forms in order to meet the needs of communication in all its aspects.
- It is because the needs of human communication are so various and so multifarious that the study of meaning is probably the most difficult and baffling part of the serious study of language.

Structural, or grammatical, meaning

- First, one must recognize that the meaning of any sentence comprises two parts: the meanings of the words it contains and the structural or grammatical meaning carried by the sentence itself.
- In English the dog chased the cat and the boy chased the cat differ in meaning because dog and boy are different words with different word meanings; the same applies to equivalent sentences in other languages.

Lexical meaning

- The other component of sentence meaning is word meaning, the individual meanings of the words in a sentence, as lexical items.
- The concept of word meaning is a familiar one. Dictionaries list words and in one way or another state their meanings.
- It is regarded as a sensible question to ask of any word in a language, “What does it mean?” This question, like many others about language, is easier to ask than to answer.

Language and culture

- It has been seen that language is much more than the external expression and communication of internal thoughts formulated independently of their verbalization.
- In demonstrating the inadequacy and inappropriateness of such a view of language, attention has already been drawn to the ways in which one's native language is intimately and in all sorts of details related to the rest of one's life in a community and to smaller groups within that community.
- This is true of all peoples and all languages; it is a universal fact about language.

Transmission of Language and culture

- Language is transmitted culturally; that is, it is learned.
- To a lesser extent it is taught, when parents, for example, deliberately encourage their children to talk and to respond to talk, correct their mistakes, and enlarge their vocabulary.
- But it must be emphasized that children very largely acquire their first language by “grammar construction” from exposure to a random collection of utterances that they encounter.

Transmission of Language and culture

- Anthropologists speak of the relations between language and culture.
- It is indeed more in accordance with reality to consider language as a part of culture.
- Culture is here being used, as it is throughout this article, in the anthropological sense, to refer to all aspects of human life insofar as they are determined or conditioned by membership in a society.

Symbolic Systems

- "Symbolic systems" is defined as the meaningful symbols that represent the world about us.
- This is done in human language as well as in computer language.

Symbolic Systems: Study

- Cognitive science
 - studying human intelligence, natural languages and the brain as computational processes
- Artificial intelligence
 - endowing computers with human-like behavior and understanding
- Human-computer interaction
 - designing computer software and interfaces that work well with human users

Artificial Language

- Artificial languages are languages of a typically very limited size which emerge either in computer simulations between artificial agents, robot interactions or controlled psychological experiments with humans.
- They are different from both constructed languages and formal languages in that they have not been consciously devised by an individual or group but are the result of (distributed) conventionalisation processes, much like natural languages.
- Opposed to the idea of a central designer, the field of artificial language evolution in which artificial languages are studied can be regarded as a sub-part of the more general cultural evolution studies.

Artificial Language

- The idea of creation of artificial language arose in 17th and 18th century as a result of gradually decreasing international role of Latin.
- The initial schemes were mainly aimed at the development of a rational language free from inconsistent of living language and based on classification of concepts.

Artificial Language

- Artificial languages have been used in research in developmental psycholinguistics.
- Because researchers have a great deal of control over artificial languages, they have used these languages in statistical language acquisition studies, in which it can be helpful to control the linguistic patterns heard by infants.

Constructed Language

- A constructed language (sometimes called a conlang) is a language whose phonology, grammar, and vocabulary, instead of having developed naturally, are consciously devised for some purpose, which may include being devised for a work of fiction.
- A constructed language may also be referred to as an artificial, planned or invented language, or (in some cases) a fictional language.
- Planned languages (or engineered languages/engelangs) are languages that have been purposefully designed; they are the result of deliberate, controlling intervention and are thus of a form of language planning

Constructed Language

- There are many possible reasons to create a constructed language, such as to ease human communication (see international auxiliary language and code); to give fiction or an associated constructed setting an added layer of realism; for experimentation in the fields of linguistics, cognitive science, and machine learning; for artistic creation; and for language games.
- Some people make constructed languages simply because they enjoy doing it.

Logical Language

- Logical languages (often abbreviated to loglangs) are meant to allow (or enforce) unambiguous statements.
- They are typically based on predicate logic but can also be based on any system of formal logic.
- The two best-known logical languages are the predicate languages Loglan and its successor Lojban.
- They both aim to eliminate syntactical ambiguity and reduce semantic ambiguity to a minimum.
- In particular, the grammar of Lojban is carefully engineered to express such predicate logic in an unambiguous manner.

Programming Language

- A programming language is a system of notation for writing computer programs.
- Most programming languages are text-based formal languages, but they may also be graphical. They are a kind of computer language.
- The description of a programming language is usually split into the two components of syntax (form) and semantics (meaning), which are usually defined by a formal language.

Programming Language

- Some languages are defined by a specification document (for example, the C programming language is specified by an ISO Standard) while other languages (such as Perl) have a dominant implementation that is treated as a reference.
- Some languages have both, with the basic language defined by a standard and extensions taken from the dominant implementation being common.

Natural Language

- In neuropsychology, linguistics, and philosophy of language, a natural language or ordinary language is any language that has evolved naturally in humans through use and repetition without conscious planning or premeditation.
- Natural languages can take different forms, such as speech or signing.
- They are distinguished from constructed and formal languages such as those used to program computers or to study logic.

Natural Language

- Natural language can be broadly defined as different from:
 - artificial and constructed languages, e.g. computer programming languages
 - constructed international auxiliary languages
 - non-human communication systems in nature such as whale and other marine mammal vocalizations or honey bees' waggle dance

Natural Language

- "The term 'natural language' is used in opposition to the terms 'formal language' and 'artificial language,' but the important difference is that natural languages are not actually constructed as artificial languages and they do not actually appear as formal languages.
- But they are considered and studied as though they were formal languages 'in principle.'
- Behind the complex and the seemingly chaotic surface of natural languages there are — according to this way of thinking — rules and principles that determine their constitution and functions. . . ." (Sören Stenlund, Language and Philosophical Problems. Routledge, 1990)

Natural Language: Essentials

- All languages are systematic. They are governed by a set of interrelated systems that include phonology, graphics (usually), morphology, syntax, lexicon, and semantics.
- All natural languages are conventional and arbitrary.
- They obey rules, such as assigning a particular word to a particular thing or concept.
- But there is no reason that this particular word was originally assigned to this particular thing or concept.

Natural Language: Essentials

- All natural languages are redundant, meaning that the information in a sentence is signaled in more than one way.
- All natural languages change. There are various ways a language can change and various reasons for this change. (C. M. Millward and Mary Hayes, A Biography of the English Language, 3rd ed. Wadsworth, 2011)

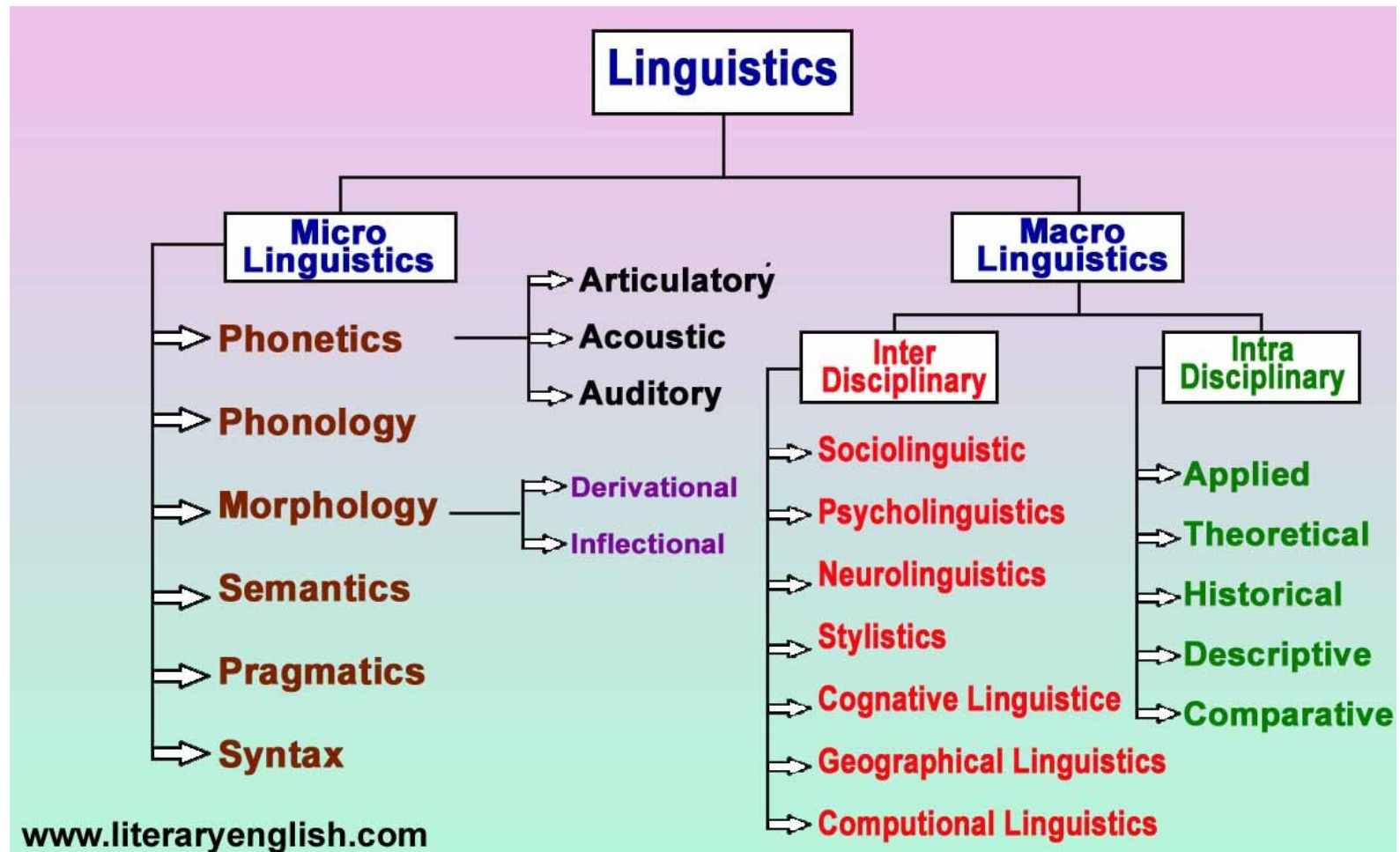
Natural Imprecision

- "Natural language is the embodiment of human cognition and human intelligence.
- It is very evident that natural language includes an abundance of vague and indefinite phrases and statements that correspond to imprecision in the underlying cognitive concepts.
- Terms such as 'tall,' 'short,' 'hot,' and 'well' are extremely difficult to translate into knowledge representation, as required for the reasoning systems under discussion.

Linguistics

- Linguistics is often called "the science of language," the study of the human capacity to communicate and organize thought using different tools (the vocal tract for spoken languages, hands for sign languages, etc.) and involving different abstract and tactile components.

Linguistics



www.literaryenglish.com

Linguistics

- Linguistics looks at:
 - The general phenomenon of human language.
 - Different families of languages (example: Germanic, including English, German, Dutch and Scandinavian, among others).
 - Specific languages (example: Arabic, Mandarin and French).
 - Communicative codes or behaviors that are not so well defined (example: the language of recent immigrants, the ways by which bilinguals choose one or another language in certain settings).

Linguistics

- Linguistics is a human science—in fact, one of the foundational disciplines in the western intellectual tradition—and may be compared with programs such as sociology, psychology or anthropology.
- As with all human sciences, there are several sub-fields in linguistics:
 - Phonetics (the study of how speech sounds are made)
 - Phonology (how these sounds are organized)
 - Morphology (how sounds are organized into units of meaning)
 - Pragmatics (the relationship between language signs and language users)
 - Semantics (the study of meanings themselves)
 - Sociolinguistics (the interaction of language and people or collectives)
 - Syntax (how units of meaning come together to create utterances)

Applied Linguistics

- Linguists are largely concerned with finding and describing the generalities and varieties both within particular languages and among all languages.
- Applied linguistics takes the results of those findings and "applies" them to other areas.
- Linguistic research is commonly applied to areas such as language education, lexicography, translation, language planning, which involves governmental policy implementation related to language use, and natural language processing.

References:

- www.mitu.co.in
- www.nltk.org
- www.en.wikipedia.org
- www.britannica.com

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