

# Linguistics

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**Linguistics** is the scientific<sup>[1]</sup> study of language,<sup>[2]</sup> and involves an analysis of language form, language meaning, and language in context.<sup>[3]</sup> The earliest activities in the documentation and description of language have been attributed to the 4th century BCE Indian grammarian Pāṇini,<sup>[4][5]</sup> who wrote a formal description of the Sanskrit language in his *Aṣṭādhyāyī*.<sup>[6]</sup>

Linguists traditionally analyse human language by observing an interplay between sound and meaning.<sup>[7]</sup> Phonetics is the study of speech and non-speech sounds, and delves into their acoustic and articulatory properties. The study of language meaning, on the other hand, deals with how languages encode relations between entities, properties, and other aspects of the world to convey, process, and assign meaning, as well as manage and resolve ambiguity.<sup>[8]</sup> While the study of semantics typically concerns itself with truth conditions, pragmatics deals with how situational context influences the production of meaning.<sup>[9]</sup>

Grammar is a system of rules which governs the production and use of utterances in a given language. These rules apply to sound<sup>[10]</sup> as well as meaning, and include componential sub-sets of rules, such as those pertaining to phonology (the organisation of phonetic sound systems), morphology (the formation and composition of words), and syntax (the formation and composition of phrases and sentences).<sup>[11]</sup> Modern theories that deal with the principles of grammar are largely based within Noam Chomsky's framework of generative linguistics.<sup>[12]</sup>

In the early 20th century, Ferdinand de Saussure distinguished between the notions of *langue* and *parole* in his formulation of structural linguistics. According to him, *parole* is the specific utterance of speech, whereas *langue* refers to an abstract phenomenon that theoretically defines the principles and system of rules that govern a language.<sup>[13]</sup> This distinction resembles the one made by Noam Chomsky between competence and performance in his theory of transformative or generative grammar. According to Chomsky, competence is an individual's innate capacity and potential for language (like in Saussure's *langue*), while performance is the specific way in which it is used by individuals, groups, and communities (i.e., *parole*, in Saussurean terms).<sup>[14]</sup>

The study of *parole* (which manifests through cultural discourses and dialects) is the domain of sociolinguistics, the sub-discipline that comprises the study of a complex system of linguistic facets within a certain speech community (governed by its own set of grammatical rules and laws). Discourse analysis further examines the structure of texts and conversations emerging out of a speech community's usage of language.<sup>[15]</sup> This is done through the collection of linguistic data, or through the formal discipline of corpus linguistics, which takes naturally occurring texts and studies the variation of grammatical and other features based on such corpora (or corpus data).

Stylistics also involves the study of written, signed, or spoken discourse through varying speech communities, genres, and editorial or narrative formats in the mass media.<sup>[16]</sup> In the 1960s, Jacques Derrida, for instance, further distinguished between speech and writing, by proposing that written language be studied as a linguistic medium of communication in itself.<sup>[17]</sup> Palaeography is therefore the discipline that studies the evolution of written scripts (as signs and symbols) in language.<sup>[18]</sup> The formal study of language also led to the growth of fields like psycholinguistics, which explores the representation and function of language in the mind; neurolinguistics, which studies language processing in the brain; biolinguistics, which studies the biology and evolution of language; and language acquisition, which investigates how children and adults acquire the knowledge of one or more languages.

Linguistics also deals with the social, cultural, historical and political factors that influence language, through which linguistic and language-based context is often determined.<sup>[19]</sup> Research on language through the sub-branches of historical and evolutionary linguistics also focus on how languages change and grow, particularly over an extended period of time.

Language documentation combines anthropological inquiry (into the history and culture of language) with linguistic inquiry, in order to describe languages and their grammars. Lexicography involves the documentation of words that form a vocabulary. Such a documentation of a linguistic vocabulary from a particular language is usually compiled in a dictionary. Computational linguistics is concerned with the statistical or rule-based modeling of natural language from a computational perspective. Specific knowledge of language is applied by speakers during the act of translation and interpretation, as well as in language education – the teaching of a second or foreign language. Policy makers work with governments to implement new plans in education and teaching which are based on linguistic research.

Related areas of study also includes the disciplines of semiotics (the study of direct and indirect language through signs and symbols), literary criticism (the historical and ideological analysis of literature, cinema, art, or published material), translation (the conversion and documentation of meaning in written/spoken text from one language or dialect onto another), and speech-language pathology (a corrective method to cure phonetic disabilities and dis-functions at the cognitive level).

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## Nomenclature

Before the 20th century, the term *philology*, first attested in 1716,<sup>[20]</sup> was commonly used to refer to the science of language, which was then predominantly historical in focus.<sup>[21][22]</sup> Since Ferdinand de Saussure's insistence on the importance of synchronic analysis, however, this focus has shifted<sup>[23]</sup> and the term "philology" is now generally used for the "study of a language's grammar, history, and literary tradition", especially in the United States<sup>[24]</sup> (where philology has never been very popularly considered as the "science of language").<sup>[25]</sup>

Although the term "linguist" in the sense of "a student of language" dates from 1641,<sup>[26]</sup> the term "linguistics" is first attested in 1847.<sup>[26]</sup> It is now the common academic term in English for the scientific study of language.

Today, the term *linguist* applies to someone who studies language or is a researcher within the field, or to someone who uses the tools of the discipline to describe and analyse specific languages.<sup>[27]</sup>

## Variation and Universality

While some theories on linguistics focus on the different varieties that language produces, among different sections of society, others focus on the universal properties that are common to all human languages. The theory of variation therefore would elaborate on the different usages of popular languages like French and English across the globe, as well as its smaller dialects and regional permutations within their national boundaries. The theory of variation looks at the cultural stages that a particular language undergoes, and these include the following.

## Pidgin

The pidgin stage in a language is a stage when communication occurs through a grammatically simplified means, developing between two or more groups that do not have a language in common. Typically, it is a mixture of languages at the stage when there occurs a mixing between a primary language with other language elements.

## Creole

A creole stage in language occurs when there is a stable natural language developed from a mixture of different languages. It is a stage that occurs after a language undergoes its pidgin stage. At the creole stage, a language is a complete language, used in a community and acquired by children as their native language.

## Dialect

A dialect is a variety of language that is characteristic of a particular group among the language speakers.<sup>[28]</sup> The group of people who are the speakers of a dialect are usually bound to each other by social identity. This is what differentiates a dialect from a register or a discourse, where in the latter case, cultural identity does not always play a role. Dialects are speech varieties that have their own grammatical and phonological rules, linguistic features, and stylistic aspects, but have not been given an official status as a language. Dialects often move on to gain the status of a language due to political and social reasons. Differentiation amongst dialects (and subsequently, languages too) is based upon the use of grammatical rules, syntactic rules, and stylistic features, though not always on lexical use or vocabulary. The popular saying that "a language is a dialect with an army and navy" is attributed as a definition formulated by Max Weinreich.

Universal grammar takes into account general formal structures and features that are common to all dialects and languages, and the template of which pre-exists in the mind of an infant child. This idea is based on the theory of generative grammar and the formal school of linguistics, whose proponents include Noam Chomsky and those who follow his theory and work.

"We may as individuals be rather fond of our own dialect. This should not make us think, though, that it is actually any better than any other dialect. Dialects are not good or bad, nice or nasty, right or wrong – they are just different from one another, and it is the mark of a civilised society that it tolerates different dialects just as it tolerates different races, religions and sexes."<sup>[29]</sup>

## Discourse

A discourse is a way of speaking that emerges within a certain social setting and is based on a certain subject matter. A particular discourse becomes a language variety when it is used in this way for a particular purpose, and is referred to as a register.<sup>[30]</sup> There may be certain lexical additions (new words) that are brought into play because of the expertise of the community of people within a certain domain of specialization. Registers and discourses therefore differentiate themselves through the use of vocabulary, and at times through the use of style too. People in the medical fraternity, for example, may use some medical terminology in their communication that is specialized to the field of medicine. This is often referred to as being part of the "medical discourse", and so on.

## Standard Language

When a dialect is documented sufficiently through the linguistic description of its grammar, which has emerged through the consensual laws from within its community, it gains political and national recognition through a country or region's policies. That is the stage when a language is considered a standard variety, one whose grammatical laws have now stabilised from within the consent of speech community participants, after sufficient evolution, improvisation, correction, and growth. The English language, besides perhaps the French language, may be examples of languages that have arrived at a stage where they are said to have become standard varieties.

The study of a language's universal properties, on the other hand, include some of the following concepts.

## The Lexicon

The lexicon is a catalogue of words and terms that are stored in a speaker's mind. The lexicon consists of words and bound morphemes, which are parts of words that can't stand alone, like affixes. In some analyses, compound words and certain classes of idiomatic expressions and other collocations are also considered to be part of the lexicon. Dictionaries represent attempts at listing, in alphabetical order, the lexicon of a given language; usually, however, bound morphemes are not included. Lexicography, closely linked with the domain of semantics, is the science of mapping the words into an encyclopedia or a dictionary. The creation and addition of new words (into the lexicon) is called coining or neologization,<sup>[31]</sup> and the new words are called neologisms.

It is often believed that a speaker's capacity for language lies in the quantity of words stored in the lexicon. However, this is often considered a myth by linguists. The capacity for the use of language is considered by many linguists to lie primarily in the domain of grammar, and to be linked with competence, rather than with the growth of vocabulary. Even a very small lexicon is theoretically capable of producing an infinite number of sentences.

## Relativity

As constructed popularly through the Sapir–Whorf hypothesis, relativists believe that the structure of a particular language is capable of influencing the cognitive patterns through which a person shapes his or her world view. Universalists believe that there are commonalities between human perception as there is in the human capacity for language, while relativists believe that this varies from language to language and person to person. While the Sapir–Whorf hypothesis is an elaboration of this idea expressed through the writings of American linguists Edward Sapir and Benjamin Lee Whorf, it was Sapir's student Harry Hoiyer who termed it thus. The 20th century German linguist Leo Weisgerber also wrote extensively about the theory of relativity. Relativists argue for the case of differentiation at the level of cognition and in semantic domains. The emergence of cognitive linguistics in the 1980s also revived an interest in linguistic relativity. Thinkers like George Lakoff have argued that language reflects different cultural metaphors, while the French philosopher of language Jacques Derrida's writings have been seen to be closely associated with the relativist movement in linguistics, especially through deconstruction<sup>[32]</sup> and was even heavily criticized in the media at the time of his death for his theory of relativism.<sup>[33]</sup>

## Structures

Linguistic structures are pairings of meaning and form. Any particular pairing of meaning and form is a Saussurean sign. For instance, the meaning "cat" is represented worldwide with a wide variety of different sound patterns (in oral languages), movements of the hands and face (in sign languages), and written symbols

(in written languages).

Linguists focusing on structure attempt to understand the rules regarding language use that native speakers know (not always consciously). All linguistic structures can be broken down into component parts that are combined according to (sub)conscious rules, over multiple levels of analysis. For instance, consider the structure of the word "tenth" on two different levels of analysis. On the level of internal word structure (known as morphology), the word "tenth" is made up of one linguistic form indicating a number and another form indicating ordinality. The rule governing the combination of these forms ensures that the ordinality marker "th" follows the number "ten." On the level of sound structure (known as phonology), structural analysis shows that the "n" sound in "tenth" is made differently from the "n" sound in "ten" spoken alone. Although most speakers of English are consciously aware of the rules governing internal structure of the word pieces of "tenth", they are less often aware of the rule governing its sound structure. Linguists focused on structure find and analyse rules such as these, which govern how native speakers use language.

Linguistics has many sub-fields concerned with particular aspects of linguistic structure. The theory that elucidates on these, as propounded by Noam Chomsky, is known as generative theory or universal grammar. These sub-fields range from those focused primarily on form to those focused primarily on meaning. They also run the gamut of level of analysis of language, from individual sounds, to words, to phrases, up to cultural discourse.

## Grammar

Sub-fields that focus on a grammatical study of language include the following.

- **Phonetics**, the study of the physical properties of speech sound production and perception
- **Phonology**, the study of sounds as abstract elements in the speaker's mind that distinguish meaning (phonemes)
- **Morphology**, the study of morphemes, or the internal structures of words and how they can be modified
- **Syntax**, the study of how words combine to form grammatical phrases and sentences
- **Semantics**, the study of the meaning of words (lexical semantics) and fixed word combinations (phraseology), and how these combine to form the meanings of sentences
- **Pragmatics**, the study of how utterances are used in communicative acts, and the role played by context and non-linguistic knowledge in the transmission of meaning
- **Discourse analysis**, the analysis of language use in texts (spoken, written, or signed)
- **Stylistics**, the study of linguistic factors (rhetoric, diction, stress) that place a discourse in context
- **Semiotics**, the study of signs and sign processes (semiosis), indication, designation, likeness, analogy, metaphor, symbolism, signification, and communication.

## Style

Stylistics is the study and interpretation of texts for aspects of their linguistic and tonal style. Stylistic analysis entails the analysis of description of particular dialects and registers used by speech communities. Stylistic features include rhetoric,<sup>[34]</sup> diction, stress, satire, irony, dialogue, and other forms of phonetic variations. Stylistic analysis can also include the study of language in canonical works of literature, popular fiction, news, advertisements, and other forms of communication in popular culture as well. It is usually seen as a variation in communication that changes from speaker to speaker and community to community. In short, Stylistics is the interpretation of text.

# Approaches

## Theoretical

One major debate in linguistics concerns how language should be defined and understood. Some linguists use the term "language" primarily to refer to a hypothesized, innate module in the human brain that allows people to undertake linguistic behaviour, which is part of the formalist approach. This "universal grammar" is considered to guide children when they learn languages and to constrain what sentences are considered grammatical in any language. Proponents of this view, which is predominant in those schools of linguistics that are based on the generative theory of Noam Chomsky, do not necessarily consider that language evolved for communication in particular. They consider instead that it has more to do with the process of structuring human thought (see also formal grammar).

## Functional

Another group of linguists, by contrast, use the term "language" to refer to a communication system that developed to support cooperative activity and extend cooperative networks. Such theories of grammar, called "functional", view language as a tool that emerged and is adapted to the communicative needs of its users, and the role of cultural evolutionary processes are often emphasized over that of biological evolution.<sup>[35]</sup>

## Methodology

Linguistics is primarily descriptive. Linguists describe and explain features of language without making subjective judgments on whether a particular feature or usage is "good" or "bad". This is analogous to practice in other sciences: a zoologist studies the animal kingdom without making subjective judgments on whether a particular species is "better" or "worse" than another.

Prescription, on the other hand, is an attempt to promote particular linguistic usages over others, often favouring a particular dialect or "acrolect". This may have the aim of establishing a linguistic standard, which can aid communication over large geographical areas. It may also, however, be an attempt by speakers of one language or dialect to exert influence over speakers of other languages or dialects (see Linguistic imperialism). An extreme version of prescriptivism can be found among censors, who attempt to eradicate words and structures that they consider to be destructive to society. Prescription, however, may be practised appropriately in the teaching of language, like in ELT, where certain fundamental grammatical rules and lexical terms need to be introduced to a second-language speaker who is attempting to acquire the language.

## Anthropology

The objective of describing languages is often to uncover cultural knowledge about communities. The use of anthropological methods of investigation on linguistic sources leads to the discovery of certain cultural traits among a speech community through its linguistic features. It is also widely used as a tool in language documentation, with an endeavour to curate endangered languages. However, now, linguistic inquiry uses the anthropological method to understand cognitive, historical, sociolinguistic and historical processes that languages undergo as they change and evolve, as well as general anthropological inquiry uses the linguistic method to excavate into culture. In all aspects, anthropological inquiry usually uncovers the different variations and relativities that underlie the usage of language.

## Sources

Most contemporary linguists work under the assumption that spoken data and signed data is more fundamental than written data. This is because:

- Speech appears to be universal to all human beings capable of producing and perceiving it, while there have been many cultures and speech communities that lack written communication;
- Features appear in speech which aren't always recorded in writing, including phonological rules, sound changes, and speech errors;
- All natural writing systems reflect a spoken language (or potentially a signed one) they are being used to write, with even pictographic scripts like Dongba writing Naxi homophones with the same pictogram, and text in writing systems used for two languages changing to fit the spoken language being recorded;
- Speech evolved before human beings invented writing;
- People learnt to speak and process spoken language more easily and earlier than they did with writing.

Nonetheless, linguists agree that the study of written language can be worthwhile and valuable. For research that relies on corpus linguistics and computational linguistics, written language is often much more convenient for processing large amounts of linguistic data. Large corpora of spoken language are difficult to create and hard to find, and are typically transcribed and written. In addition, linguists have turned to text-based discourse occurring in various formats of computer-mediated communication as a viable site for linguistic inquiry.

The study of writing systems themselves, graphemics, is, in any case, considered a branch of linguistics.

## Analysis

Before the 20th century, linguists analysed language on a diachronic plane, which was historical in focus. This meant that they would compare linguistic features and try to analyse language from the point of view of how it had changed between then and later. However, with Saussurean linguistics in the 20th century, the focus shifted to a more synchronic approach, where the study was more geared towards analysis and comparison between different language variations, which existed at the same given point of time.

At another level, the syntagmatic plane of linguistic analysis entails the comparison between the way words are sequenced, within the syntax of a sentence. For example, the article "the" is followed by a noun, because of the syntagmatic relation between the words. The paradigmatic plane on the other hand, focuses on an analysis that is based on the paradigms or concepts that are embedded in a given text. In this case, words of the same type or class may be replaced in the text with each other to achieve the same conceptual understanding.

## History

### Early Grammarians

The formal study of language began in India with Pāṇini, the 5th century BC grammarian who formulated 3,959 rules of Sanskrit morphology. Pāṇini's systematic classification of the sounds of Sanskrit into consonants and vowels, and word classes, such as nouns and verbs, was the first known instance of its kind. In the Middle East, Sibawayh, a non-Arab, made a detailed description of Arabic in 760 AD in his monumental work, *Al-kitab fi al-nahw* (الكتاب في النحو, *The Book on Grammar*), the first known author to distinguish between sounds and phonemes (sounds as units of a linguistic system). Western interest in the study of languages began somewhat later than in the East,<sup>[36]</sup> but the grammarians of the classical languages did not use the same methods or reach the same conclusions as their contemporaries in the Indic world. Early interest in language in the West was a part of philosophy, not of grammatical description. The first insights into semantic theory were made by Plato in his *Cratylus* dialogue, where he argues that words denote concepts that are eternal and exist in the world of

ideas. This work is the first to use the word etymology to describe the history of a word's meaning. Around 280 BC, one of Alexander the Great's successors founded a university (see Musaeum) in Alexandria, where a school of philologists studied the ancient texts in and taught Greek to speakers of other languages. While this school was the first to use the word "grammar" in its modern sense, Plato had used the word in its original meaning as "téchnē grammatikḗ" (Τέχνη Γραμματική), the "art of writing", which is also the title of one of the most important works of the Alexandrine school by Dionysius Thrax.<sup>[37]</sup> Throughout the Middle Ages, the study of language was subsumed under the topic of philology, the study of ancient languages and texts, practised by such educators as Roger Ascham, Wolfgang Ratke, and John Amos Comenius.<sup>[38]</sup>



Ancient Tamil inscription at Thanjavur

## Comparative philology

In the 18th century, the first use of the comparative method by William Jones sparked the rise of comparative linguistics.<sup>[39]</sup> Bloomfield attributes "the first great scientific linguistic work of the world" to Jacob Grimm, who wrote *Deutsche Grammatik*.<sup>[40]</sup> It was soon followed by other authors writing similar comparative studies on other language groups of Europe. The scientific study of language was broadened from Indo-European to language in general by Wilhelm von Humboldt, of whom Bloomfield asserts:<sup>[40]</sup>

This study received its foundation at the hands of the Prussian statesman and scholar Wilhelm von Humboldt (1767–1835), especially in the first volume of his work on Kavi, the literary language of Java, entitled *Über die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluß auf die geistige Entwicklung des Menschengeschlechts* (*On the Variety of the Structure of Human Language and its Influence upon the Mental Development of the Human Race*).

## Structuralism

Early in the 20th century, Saussure introduced the idea of language as a static system of interconnected units, defined through the oppositions between them. By introducing a distinction between diachronic and synchronic analyses of language, he laid the foundation of the modern discipline of linguistics. Saussure also introduced several basic dimensions of linguistic analysis that are still foundational in many contemporary linguistic theories, such as the distinctions between syntagm and paradigm, and the langue- parole distinction, distinguishing language as an abstract system (*langue*) from language as a concrete manifestation of this system (*parole*).<sup>[41]</sup> Substantial additional contributions following Saussure's definition of a structural approach to language came from The Prague school, Leonard Bloomfield, Charles F. Hockett, Louis Hjelmslev, Émile Benveniste and Roman Jakobson.<sup>[42][43]</sup>

## Generativism

During the last half of the 20th century, following the work of Noam Chomsky, linguistics was dominated by the generativist school. While formulated by Chomsky in part as a way to explain how human beings acquire language and the biological constraints on this acquisition, in practice it has largely been concerned with giving formal accounts of specific phenomena in natural languages. Generative theory is modularist and formalist in

character. Chomsky built on earlier work of Zellig Harris to formulate the generative theory of language. According to this theory the most basic form of language is a set of syntactic rules universal for all humans and underlying the grammars of all human languages. This set of rules is called Universal Grammar, and for Chomsky describing it is the primary objective of the discipline of linguistics. For this reason the grammars of individual languages are of importance to linguistics only in so far as they allow us to discern the universal underlying rules from which the observable linguistic variability is generated.

In the classic formalization of generative grammars first proposed by Noam Chomsky in the 1950s,<sup>[44][45]</sup> a grammar *G* consists of the following components:

- A finite set *N* of *nonterminal symbols*, none of which appear in strings formed from *G*.
- A finite set  $\Sigma$  of *terminal symbols* that is disjoint from *N*.
- A finite set *P* of *production rules*, that map from one string of symbols to another.

A formal description of language attempts to replicate a speaker's knowledge of the rules of their language, and the aim is to produce a set of rules that is minimally sufficient to successfully model valid linguistic forms.

## Functionalism

Functional theories of language propose that since language is fundamentally a tool, it is reasonable to assume that its structures are best analysed and understood with reference to the functions they carry out. Functional theories of grammar differ from formal theories of grammar, in that the latter seek to define the different elements of language and describe the way they relate to each other as systems of formal rules or operations, whereas the former defines the functions performed by language and then relates these functions to the linguistic elements that carry them out. This means that functional theories of grammar tend to pay attention to the way language is actually used, and not just to the formal relations between linguistic elements.<sup>[46]</sup>

Functional theories describe language in term of the functions existing at all levels of language.

- Phonological function: the function of the phoneme is to distinguish between different lexical material.
- Semantic function: (Agent, Patient, Recipient, etc.), describing the role of participants in states of affairs or actions expressed.
- Syntactic functions: (e.g. Subject and Object), defining different perspectives in the presentation of a linguistic expression
- Pragmatic functions: (Theme and Rheme, Topic and Focus, Predicate), defining the informational status of constituents, determined by the pragmatic context of the verbal interaction. Functional descriptions of grammar strive to explain how linguistic functions are performed in communication through the use of linguistic forms.

## Cognitive linguistics

Cognitive linguistics emerged as a reaction to generativist theory in the 1970s and 1980s. Led by theorists like Ronald Langacker and George Lakoff, cognitive linguists propose that language is an emergent property of basic, general-purpose cognitive processes. In contrast to the generativist school of linguistics, cognitive linguistics is non-modularist and functionalist in character. Important developments in cognitive linguistics include cognitive grammar, frame semantics, and conceptual metaphor, all of which are based on the idea that form–function correspondences based on representations derived from embodied experience constitute the basic units of language.

Cognitive linguistics interprets language in terms of concepts (sometimes universal, sometimes specific to a particular tongue) that underlie its form. It is thus closely associated with semantics but is distinct from psycholinguistics, which draws upon empirical findings from cognitive psychology in order to explain the mental processes that underlie the acquisition, storage, production and understanding of speech and writing. Unlike generative theory, cognitive linguistics denies that there is an *autonomous linguistic faculty* in the mind; it understands grammar in terms of *conceptualization*; and claims that knowledge of language arises out of *language use*.<sup>[47]</sup> Because of its conviction that knowledge of language is learned through use, cognitive linguistics is sometimes considered to be a functional approach, but it differs from other functional approaches in that it is primarily concerned with how the mind creates meaning through language, and not with the use of language as a tool of communication.

## Areas of Research

### Historical Linguistics

Historical linguists study the history of specific languages as well as general characteristics of language change. The study of language change is also referred to as "diachronic linguistics" (the study of how one particular language has changed over time), which can be distinguished from "synchronic linguistics" (the comparative study of more than one language at a given moment in time without regard to previous stages). Historical linguistics was among the first sub-disciplines to emerge in linguistics, and was the most widely practised form of linguistics in the late 19th century. However, there was a shift to the synchronic approach in the early twentieth century with Saussure, and became more predominant in western linguistics with the work of Noam Chomsky.

### Ecolinguistics

Ecolinguistics explores the role of language in the life-sustaining interactions of humans, other species and the physical environment. The first aim is to develop linguistic theories which see humans not only as part of society, but also as part of the larger ecosystems that life depends on. The second aim is to show how linguistics can be used to address key ecological issues, from climate change and biodiversity loss to environmental justice. (Ecolinguistics Association (<http://ecolinguistics-association.org/>))

### Sociolinguistics

Sociolinguistics is the study of how language is shaped by social factors. This sub-discipline focuses on the synchronic approach of linguistics, and looks at how a language in general, or a set of languages, display variation and varieties at a given point in time. The study of language variation and the different varieties of language through dialects, registers, and idiolects can be tackled through a study of style, as well as through analysis of discourse. Sociolinguists research on both style and discourse in language, and also study the theoretical factors that are at play between language and society.

### Developmental Linguistics

Developmental linguistics is the study of the development of linguistic ability in individuals, particularly the acquisition of language in childhood. Some of the questions that developmental linguistics looks into is how children acquire language, how adults can acquire a second language, and what the process of language acquisition is.

## Neurolinguistics

Neurolinguistics is the study of the structures in the human brain that underlie grammar and communication. Researchers are drawn to the field from a variety of backgrounds, bringing along a variety of experimental techniques as well as widely varying theoretical perspectives. Much work in neurolinguistics is informed by models in psycholinguistics and theoretical linguistics, and is focused on investigating how the brain can implement the processes that theoretical and psycholinguistics propose are necessary in producing and comprehending language. Neurolinguists study the physiological mechanisms by which the brain processes information related to language, and evaluate linguistic and psycholinguistic theories, using aphasiology, brain imaging, electrophysiology, and computer modelling

## 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. "Applied linguistics" has been argued to be something of a misnomer.<sup>[48]</sup> Applied linguists actually focus on making sense of and engineering solutions for real-world linguistic problems, and not literally "applying" existing technical knowledge from linguistics. Moreover, they commonly apply technical knowledge from multiple sources, such as sociology (e.g., conversation analysis) and anthropology. (Constructed language fits under Applied linguistics.)

Today, computers are widely used in many areas of applied linguistics. Speech synthesis and speech recognition use phonetic and phonemic knowledge to provide voice interfaces to computers. Applications of computational linguistics in machine translation, computer-assisted translation, and natural language processing are areas of applied linguistics that have come to the forefront. Their influence has had an effect on theories of syntax and semantics, as modelling syntactic and semantic theories on computers constraints.

Linguistic analysis is a sub-discipline of applied linguistics used by many governments to verify the claimed nationality of people seeking asylum who do not hold the necessary documentation to prove their claim.<sup>[49]</sup> This often takes the form of an interview by personnel in an immigration department. Depending on the country, this interview is conducted either in the asylum seeker's native language through an interpreter or in an international *lingua franca* like English.<sup>[49]</sup> Australia uses the former method, while Germany employs the latter; the Netherlands uses either method depending on the languages involved.<sup>[49]</sup> Tape recordings of the interview then undergo language analysis, which can be done either by private contractors or within a department of the government. In this analysis, linguistic features of the asylum seeker are used by analysts to make a determination about the speaker's nationality. The reported findings of the linguistic analysis can play a critical role in the government's decision on the refugee status of the asylum seeker.<sup>[49]</sup>

## Interdisciplinary fields

Within the broad discipline of linguistics, various emerging sub-disciplines focus on a more detailed description and analysis of language, and are often organized on the basis of the school of thought and theoretical approach that they pre-suppose, or the external factors that influence them.

## Semiotics

Semiotics is the study of sign processes (semiosis), or signification and communication, signs, and symbols, both individually and grouped into sign systems, including the study of how meaning is constructed and understood. Semioticians often do not restrict themselves to linguistic communication when studying the use of signs but extend the meaning of "sign" to cover all kinds of cultural symbols. Nonetheless, semiotic disciplines closely related to linguistics are literary studies, discourse analysis, text linguistics, and philosophy of language. Semiotics, within the linguistics paradigm, is the study of the relationship between language and culture. Historically, Edward Sapir and Ferdinand De Saussure's structuralist theories influenced the study of signs extensively until the late part of the 20th century, but later, post-modern and post-structural thought, through language philosophers including Jacques Derrida, Mikhail Bakhtin, Michel Foucault, and others, have also been a considerable influence on the discipline in the late part of the 20th century and early 21st century.<sup>[50]</sup> These theories emphasize the role of language variation, and the idea of subjective usage, depending on external elements like social and cultural factors, rather than merely on the interplay of formal elements.

## Language documentation

Since the inception of the discipline of linguistics, linguists have been concerned with describing and analysing previously undocumented languages. Starting with Franz Boas in the early 1900s, this became the main focus of American linguistics until the rise of formal structural linguistics in the mid-20th century. This focus on language documentation was partly motivated by a concern to document the rapidly disappearing languages of indigenous peoples. The ethnographic dimension of the Boasian approach to language description played a role in the development of disciplines such as sociolinguistics, anthropological linguistics, and linguistic anthropology, which investigate the relations between language, culture, and society.

The emphasis on linguistic description and documentation has also gained prominence outside North America, with the documentation of rapidly dying indigenous languages becoming a primary focus in many university programmes in linguistics. Language description is a work-intensive endeavour, usually requiring years of field work in the language concerned, so as to equip the linguist to write a sufficiently accurate reference grammar. Further, the task of documentation requires the linguist to collect a substantial corpus in the language in question, consisting of texts and recordings, both sound and video, which can be stored in an accessible format within open repositories, and used for further research.<sup>[51]</sup>

## Translation

The sub-field of translation includes the translation of written and spoken texts across mediums, from digital to print and spoken. To translate literally means to transmute the meaning from one language into another. Translators are often employed by organizations, such as travel agencies as well as governmental embassies to facilitate communication between two speakers who do not know each other's language. Translators are also employed to work within computational linguistics setups like Google Translate for example, which is an automated, programmed facility to translate words and phrases between any two or more given languages. Translation is also conducted by publishing houses, which convert works of writing from one language to another in order to reach varied audiences. Academic Translators, specialize and semi specialize on various other disciplines such as; Technology, Science, Law, Economics etc.

## Biolinguistics

Biolinguistics is the study of the biology and evolution of language. It is a highly interdisciplinary field, including linguists, biologists, neuroscientists, psychologists, mathematicians, and others. By shifting the focus of investigation in linguistics to a comprehensive scheme that embraces natural sciences, it seeks to yield a framework by which we can understand the fundamentals of the faculty of language.

## Clinical linguistics

Clinical linguistics is the application of linguistic theory to the fields of Speech-Language Pathology. Speech language pathologists work on corrective measures to cure communication disorders and swallowing disorders

Chaika (1990) showed that schizophrenics with speech disorders, like rhyming inappropriately have attentional dysfunction, as when a patient, shown a colour chip and, then asked to identify it, responded "Looks like clay. Sounds like gray. Take you for a roll in the hay. Heyday, May Day." The color chip was actually clay-colored, so his first response was correct.'

However, normals suppress or ignore words which rhyme with what they've said unless they are deliberately producing a pun, poem or rap. Even then, the speaker shows connection between words chosen for rhyme and an overall meaning in discourse. schizophrenics with speech dysfunction show no such relation between rhyme and reason. Some even produce stretches of gibberish combined with recognizable words.

[52] copyright Elaine Ostrach Chaika>

## Computational linguistics

Computational linguistics is the study of linguistic issues in a way that is "computationally responsible", i.e., taking careful note of computational consideration of algorithmic specification and computational complexity, so that the linguistic theories devised can be shown to exhibit certain desirable computational properties and their implementations. Computational linguists also work on computer language and software development.

## Evolutionary linguistics

Evolutionary linguistics is the interdisciplinary study of the emergence of the language faculty through human evolution, and also the application of evolutionary theory to the study of cultural evolution among different languages. It is also a study of the dispersal of various languages across the globe, through movements among ancient communities.<sup>[53]</sup>

## Forensic linguistics

Forensic linguistics is the application of linguistic analysis to forensics. Forensic analysis investigates on the style, language, lexical use, and other linguistic and grammatical features used in the legal context to provide evidence in courts of law. Forensic linguists have also contributed expertise in criminal cases.

## See also

- Anthroponymy
- Articulatory phonology
- Articulatory synthesis
- Asemic writing
- Axiom of categoricity
- Biosemiotics
- Cognitive science
- Concept mining
- Critical discourse analysis
- Cryptanalysis
- Decipherment
- Global language system
- Glottometrics
- Grammarian (Greco-Roman world)
- Integrational linguistics
- Integrationism
- Intercultural competence
- International Congress of Linguists

- International Linguistics Olympiad
- Language attrition
- Language engineering
- Language geography
- Linguistic typology
- List of departments of linguistics
- List of summer schools of linguistics
- Metacommunicative competence
- Microlinguistics
- Onomastics
- Reading
- Rhythm § Linguistics
- Speaker recognition
- Speech processing
- Stratificational linguistics

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## External links

- The Linguist List (http://linguistlist.org/), a global online linguistics community with news and information updated daily
- Glossary of linguistic terms (http://www.sil.org/linguistics/GlossaryOfLinguisticTerms/index.htm) by SIL International (last updated 2004)
- Language Log (http://languagelog.ldc.upenn.edu/nll/), a linguistics blog maintained by prominent (popular science) linguists
- Glottopedia (http://www.glottopedia.org), MediaWiki-based encyclopedia of linguistics, under construction
- Linguistic sub-fields (http://www.lsadc.org/info/ling-fields.cfm) – according to the Linguistic Society of America
- Linguistics and language-related wiki articles on Scholarpedia (http://www.scholarpedia.org/article/Language) and Citizendium (http://en.citizendium.org/wiki/Linguistics)
- "Linguistics" section (http://www.unizar.es/departamentos/filologia\_inglesa/garciala/bibliography.html) – A Bibliography of Literary Theory, Criticism and Philology, ed. J. A. García Landa (University of Zaragoza, Spain)
- An Academic Linguistics (http://www.lingforum.com/forum) Forum (currently some technical problems, Feb 2013)
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- Computerized comparative linguistics (http://www.elinguistics.net/) Calculator to compare the relatedness (genetic proximity) for over 160 languages (from Afar to Zulu)
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