with one's viewpoint. He claimed that philosophy is the theory of science, the subject of which is the study of human cognition. Thus, he supplemented his researches with psychological evidence and data now referred to as semantic. Twardowski divided the cognitive psychical, phenomena into representations and statements; the former into images and conceptions. According to this distinction, representation is not an element of a statement, but a necessary condition of it (idiogenetic theory of statements). For example, the conception of a rectangle consists of an image of some plain geometric figure that the agent complements with another two characteristics: rectangular and equilateral.

Apart from investigating purely scientific problems, Twardowski cultivated a rule of clear speaking according to his saying, 'the one who speaks unclearly, thinks unclearly,' in which he always called for proofs of every statement and avoided speculations. Later, his students formed the Warsaw-Lvov School of Philosophy, and, since they followed Twardowski's ideas, it was a school of analytic philosophy. Twardowski died on February 12, 1938 in Lvov.

See also: Kotarbinski, Tadeusz (1912–1998); Kuryowicz, Jerzy (1895–1978).

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20th-Century Linguistics: Overview of Trends

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Introduction

Two theoretical trends can be considered as hallmarks of 20th-century linguistics: structural linguistics and generative grammar. They almost equally divide this epoch: structural linguistics (or, shortly, structuralism) flourished between the 1910s and the 1950s, generative grammar from the 1950s. Structuralism was not a unitary theory, but rather a galaxy of schools sharing some principles; furthermore, some important differences distinguish European structuralist schools from the American one. Generative grammar, instead, originated as a unitary theory, which subsequently divided into different schools and which stimulated several alternatives from scholars not accepting it.

Both structural linguistics and generative grammar also had an impact outside linguistics: between the 1950s and 1970s (especially in France), the former became the model for all humanities, hence a 'structural' anthropology, a 'structural' sociology, etc., were developed. Generative grammar, in its turn, was seen as one of the initial steps of the so-called cognitive revolution. Neither of these extensions was free of problems: in many cases, concepts of structural linguistics were applied to other fields with some illegitimate modifications, and the debate on what 'cognitive' really means has not yet come to a solution. All this, however, does not lessen the outstanding role of both structuralism and generative grammar within 20th-century linguistics and within 20th-century thought in general. This article will therefore focus almost exclusively on these two theoretical trends: even sociolinguistics will be dealt with rather as an alternative to generative grammar rather

than in its applied aspects (language policy, etc.). Also other fields, such as language teaching, experimental phonetics, and so on, will not be presented in this overview: this does not mean that they have not reached important results during the 20th century.

20th-Century Linguistics vs. 19th-Century Linguistics: Continuities and Breakthroughs

It is a widely held opinion that the 19th century has been 'the century of comparative and historical linguistics' and the 20th century that of 'general' or 'theoretical' linguistics. Such an opinion is certainly not ungrounded, but it needs some qualifications. Indeed, historical linguistics in the modern sense originated in the 19th century and experienced an astonishingly fast development: in the course of about 80 years, the whole structure of historical-comparative grammar of Indo–European languages reached its final form. Later discoveries (e.g., of languages like Hittite or Mycenaean Greek) added some new data, but the overall architecture built by the Neogrammarians nevertheless remained valid, and it is still today the frame of reference for any historical linguist working in the domain of comparative grammar of Indo–European languages. However, historical-comparative grammar was not the only subject investigated by 19th-century linguists; as a matter of fact, many of them dealt with topics that one would certainly label, today, 'general linguistics.' This phrase may refer to somewhat different research perspectives, as, e.g., (1) speculation on language in general, hence also on language change (and investigation of the principles of historical linguistics plainly enters into this kind of research), and (2) all kind of linguistics that is not historical ('synchronic,' or 'panchronic' in Saussure's terms). Both kinds of general linguistics were practiced during the 19th century. W. von Humboldt (1767–1835) was not an isolated exception: his speculations on the nature of language and his typological classification of languages were developed by several of his followers, such as Heymann Steinthal (1823–1899), Georg von der Gabelentz (1840–1893), and Franz Misteli (1841–1903). But also the first generations of comparative linguists had the study of language in general as their first goal. For example, Franz Bopp (1791–1867) reconstructed Proto-Indoeuropean verbal forms according to a scheme of verb phrase, which is heavily influenced from Port-Royal views. Even August Schleicher's (1821–1868) views about language and language change belong to 'general linguistics' in the former of the senses alluded to earlier. The debate of the 1880s, about the 'sound laws'

(*Lautgesetze*), possibly marks the highest point of this kind of general linguistics: shortly after conclusion of such debate, it gradually became less and less important. A 'paradigm' in the Kuhnian sense has developed: the majority of scholars consider only a given set of problems as 'scientific,' namely those of a historical kind. This paradigm is general labeled as the 'Neogrammarian' one: but it cannot be forgotten that many of the Neogrammarians also dealt with topics of general linguistics in both senses quoted earlier. The often labeled 'Neogrammarian Bible,' namely Hermann Paul's (1846–1921) *Prinzipien der Sprachgeschichte* (I ed. 1880; V and last ed. 1920), deals with topics both of historical linguistics and of general linguistics. For example, Paul defined some oppositions that seem to foreshadow some Saussurean dichotomies (see next section) – that of 'descriptive grammar' vs. 'historical grammar' (which could be held to correspond to that between synchronic and diachronic linguistics), or that of 'individual linguistic activity' vs. 'linguistic usage,' which could be considered analogous to that of *parole* vs. *langue*. Similar distinctions were also introduced by Gabelentz in his *Sprachwissenschaft* (I ed. 1891; II ed. 1901), where three meanings of the term *language* (*Sprache*) are distinguished: (a) 'discourse' (*Rede*); (b) 'a totality of expressive means for any thought'; and (c) 'linguistic capacity' (*Sprachvermögen*), i.e., "a faculty innate to all peoples of expressing thought by means of language." Sense (a) could be made to correspond to Saussure's *parole*, sense (b) to *langue*, and sense (c) to *faculté de langage*. Even if it is quite probable that Saussure knew both Paul's and Gabelentz's work, such correspondences are more seeming than real, as will be seen in the next section. The fact cannot be overlooked, however, that such matters typically belong to general linguistics. As can be seen from their life dates, neither Gabelentz nor Paul were much older than Ferdinand de Saussure (1857–1913): why, then, are they normally presented in histories of 19th-century linguistics, whereas Saussure is considered as the 'father' of 20th-century linguistics? This is mainly due to the fact that Saussure and his followers dealt with more or less the same stuff, but in a different perspective. Summarizing so far, one could say that topics in general linguistics show a continuity between the 19th and 20th centuries, but the way of looking at them shows a definite breakthrough.

Ferdinand de Saussure

As is well known, Saussure's *Cours de linguistique générale* (Saussure, 1922) was not directly written by him, but it was compiled by two former students,

Charles Bally (1865–1947) and Albert Sechehaye (1870–1946), on the basis of the notes from class lectures given by Saussure in the academic years 1906-7, 1908-9, and 1910–11 at the University of Geneva. It is perhaps lesser known that neither Bally nor Sechehaye attended any of these lectures: they simply reworked and systematized the notes that others had passed to them. As a result, their reconstruction is often considered not quite faithful to the authentic Saussurean thought, especially after detailed studies of the handwritten notes by Godel (1957) and their edition by Engler (1967–74). Tullio De Mauro's very detailed and insightful commentary on the *Cours* (published since 1972 together with Saussure's original text) stresses many points of Saussure's original thinking that were more or less modified by the editors. Today the exact knowledge of Saussure's ideas cannot be gained without the support of De Mauro's commentary and/or the attentive reading of Engler's edition. Nevertheless, because only the Bally–Sechehaye edition was available until the 1960s, this text actually influenced the immediately subsequent linguists. Hence, reference will be made in what follows almost exclusively to the Bally–Sechehaye edition.

Saussure's linguistic views are standardly epitomized by his so-called dichotomies: (1) *langue* vs. *parole*; (2) synchrony vs. diachrony; (3) signifier vs. signified (*signifiant ~ signifié*); and (4) associative vs. syntagmatic relations. (1) opposes the social aspect of language, the code shared by a speaking community (*langue*), to the individual speech act (*parole*); (2) opposes the state of a language at a given moment of its history to its change during the time; (3) defines the 'two sides of the linguistic sign,' namely the 'acoustic image' and the 'concept'; and (4) opposes the relation between elements in succession, such as *teach + ing* in *teaching*, to that between elements alternative to each other: e.g., *teaching* as alternative to *learning*, or *studying*, etc. All these dichotomies were surely attested in 19th-century linguistics: that of the social vs. the individual aspect of language was already sketched among others by Paul and Gabelentz (see previous section; it must be added that Saussure also hinted at the notion of *faculté de langage*, language faculty, which shows analogies with Gabelentz's *Sprachvermögen*); the synchrony/diachrony opposition could have a foreshadowing in Paul's distinction between 'descriptive grammar' and 'historical grammar'; the idea that the linguistic sign is two sided, in the sense that the meaning is not external, but internal to it, could be traced back even to the Stoics; and also the existence of two kind of relations in language could already be found, e.g., in some of Paul's pages. Two features, however, strongly differentiate Saussure from his predecessors: (1) a systemic

approach, and (2) a strong tendency to define the basic concepts of linguistics without anchoring them to other disciplines, such as sociology, psychology, etc. Saussure's key notion is that of language (*langue*) as a 'system of signs,' each of which has no intrinsic value, but whose value is determined solely by their relationships with the other members of the system ("*dans la langue, il n'y a que des différences*"; Saussure, 1922: 166; original emphasis). This sign system is the code shared by all members of a linguistic community, and its only root lies in this common sharing, because linguistic signs do not have any intrinsic value. Linguistics is a part of a more general science called semiology, namely "*une science qui étudie la vie des signes au sein de la vie sociale*" (Saussure, 1922: 33; original emphasis). *Langue* is therefore a social notion because of its character of semiological code: *parole* is the use by the individual of this general code. Because linguistic signs have no foundation in external reality, but are purely differential entities, they can change across the time; this is the reason for the distinction between synchrony and diachrony. In Saussure's view, however, system exists only in synchrony, at a given moment of time; diachrony does not concern systems, but only isolated elements. A linguistic change is therefore isolated and fortuitous; only when a given sign is changed, a new system is formed, because the relations between signs are different from earlier. Finally, associative and syntagmatic relations are synchronic, because they are essentially systematic.

Saussure's view of language paved the way to what was later called structural linguistics. Even if neither 'structure' nor 'structural' (but just *système*) occur throughout Saussure's text in a technical sense, the systemic approach to language and the definition of linguistic notions and categories on a purely linguistic basis (i.e., without reference to psychological categories, and so on) became the starting points of structural linguistics.

Saussurean Trends in Europe

Geneva School

The editors of Saussure's *Cours*, namely Bally and Sechehaye, were only weakly influenced by the systemic and autonomous approach to language developed in that book. This may seem paradoxical, but it has to be kept in mind that both Bally and Sechehaye had completed their linguistic formation before Saussure's lectures in general linguistics. Among Saussurean notions, Bally especially deepened the *langue/parole* opposition. According to him, *langue* preexists *parole* from a *static* point of view. This relationship, however, is reversed from the

genetic point of view, because *parole* preceded *langue* in the genesis of language (see, e.g., Bally, 1965). Sechehaye was concerned with problems of general linguistics and its relationships with psychology and sociology since his first book (Sechehaye, 1908); in subsequent years he analyzed some fundamental problems of syntax, such as the notion of sentence. These analyses are insightful, but essentially extraneous to the structuralist trend. A stronger structuralist approach characterizes the work of Bally's pupil, Henri Frei (1899–1980); he revisited Saussure's ideas on syntagmatic and paradigmatic relationships, on the one hand, while on the other hand he confronted other descriptions of syntactic structure, mainly those of Bloomfield and of the American structuralist school (see later discussion).

Prague School

The so-called Prague School was formed by a group of linguists belonging to the 'Prague linguistic circle,' founded in 1926 by the Czech anglicist Vilém Mathesius (1882–1945). Members of this circle were, among others, the Russian scholars Serge Karcevskij (1884–1955), Roman Jakobson (1896–1982), and Nikolaj S. Trubeckoj (1890–1938). Prague School dealt with a variety of topics, from English syntax to literary criticism; however, it is especially known for its critical development of Saussurean notions expounded in the theses presented to the first International Congress of Linguists ('Prague Theses,' 1928) and for the contributions of some of its members to phonology (especially Trubeckoj and Jakobson). Among the most influential statements contained in Prague Theses, the following two can be quoted: (1) language is a functional system, whose goal is communication; and (2) the synchrony/diachrony dichotomy is not so neat as Saussure presented it: on the one hand, no linguistic state can be considered as totally independent from evolution and change; on the other, phonetic change is not blind and unsystematic as Saussure assumed, but it must be considered in the framework of the sound system that underpins it.

The most important Prague work on phonology is surely Trubeckoj's posthumous and unfinished *Principles of phonology* (Trubeckoj, 1939). Phonology was defined by Trubeckoj as "the science of sounds of *langue*," whereas phonetics is "the science of sounds of *parole*." The key notion of phonology is phoneme. Phoneme (the phonological unit) is opposed to sound (the phonetic one): the former is abstract, the latter is concrete and 'realizes' the phoneme. When two sounds occur in exactly the same positions and cannot be changed without a change in the meaning of the words, they are different

realizations of the same phoneme ('rule 2' of Trubeckoj, 1939): e.g., English [t], [p], and [k] realize three different phonemes, /t/, /p/, and /k/ because they distinguish, among others, the three words *tin*, *pin*, and *kin*. Two sounds may be different and nevertheless belong to the same phoneme: for example, English [t], [p], and [k] in the preceding examples are produced with an extra puff of air, but this puff of air does not occur, e.g., in *spin*. These two sounds do not distinguish any meaning: they are variants of the same phoneme. Phoneme inventories differ from language to language: sounds that realize the same phoneme in a language may be realizations of different phonemes in other languages. For example, aspirated stops are variants of the same phoneme in English, but they realize a phoneme of its own in Hindi.

Since the late 1940s, Jakobson remarked that phonemes are not the 'smallest distinctive units,' but they are actually constituted by even smaller entities, the distinctive features. For example, /d/ differs from /n/ (cf. *dine* vs. *nine*) because of the feature 'nasality'; and it differs from /t/ (cf. *do* vs. *to*) because of the feature 'tensedness.' During the 1950s, Jakobson, together with Morris Halle (b. 1923) further worked out his theory: any phoneme of any language is analyzed as containing or not containing a given feature from a universally fixed set of 12 (later 14) features, whose values are $+$ or $-$; (binary value, hence the label of binarism given to the theory). For example, English /t/ would have the following features: [-vocalic], [+consonantal], [-compact], [-grave], [-nasal], [+tense], [-continuous] (for the meaning of these terms, see Jakobson and Halle, 1956). Both consonants and vowels are defined on the basis of the same features, and all languages have only this inventory of features at their disposal (but some languages exploit only some of them). Jakobson's binarism was adopted (with some modifications) also by generative phonology (see discussion under Generative Phonology Section).

Copenhagen School

The most well-known linguists of the 'Copenhagen school' are Viggo Brøndal (1887–1942) and Louis Hjelmslev (1899–1965). Both scholars vigorously maintained the structuralist point of view and their Saussurean heritage. Nevertheless, their approach to language in general and to syntax in particular shows many differences; whereas Brøndal considered *language* to be based on logic, Hjelmslev's program was to give *linguistics* a logical basis, in the sense of the 'logic of science,' which was being developed in the 1930s by the neopositivistic philosophers.

In his most important book, Hjelmslev (1943) aimed at constructing a deductive theory of language that he dubbed glossematics. Such a theory should be based on purely linguistic notions ('immanent linguistics') and should follow rigorous methodological standards (it has to be "self-consistent, exhaustive and as simple as possible"). Hjelmslev assigned special importance to Saussure's statement that "language (*langue*) is form, not substance." He therefore distinguished form and substance both on the phonological and on the syntactico-semantic level (expression plane and content plane respectively, in his terms). On the expression plane, a continuous stretch of sound can be differently articulated, according to the different phonemic inventories: e.g., where English distinguishes three nasal phonemes (/m/, /n/ and /ŋ/), Italian only distinguishes two (/m/ and /n/). On the content plane, the same continuum can be differently subdivided: e.g., English divides the color spectrum from green to brown in four sections (*green, blue, gray, brown*), whereas Welsh divides it in three (*gwyrdd, glas, llwyd*). Both planes are analyzable, according to Hjelmslev, into smallest units, which are limited in number, that he called figuræ: expression figuræ are phonemes, content figuræ are semantic units from which larger semantic units can be constructed (e.g., *man* would be formed by the content figuræ 'human,' 'male,' 'adult'). Content figuræ and expression figuræ are not in one-to-one correspondence: this is the reason why two planes are postulated (otherwise, such a postulation would be superfluous and the theory would violate the simplicity requirement). Any structure that has an expression plane and a content plane is named by Hjelmslev a semiotic, whereas structures with one plane only are 'symbolic systems.' Each plane can in its turn be constituted by a semiotic, and so on.

Structural Linguistics in France: Benveniste, Martinet

Émile Benveniste (1902–1976) combined his experience in the field of historical-comparative grammar of Indo–European languages with a particular skillfulness in the analysis of linguistic facts. He was surely well acquainted with the patterns of investigation worked out by European and American structuralism, but he resorted to them only to a limited extent. Somewhat paradoxically, this allowed him to sketch some analytical proposals that are sometimes superior to those of the structuralists. Among such proposals (see Benveniste, 1966), the most well known are his remarks on Saussure's notion of arbitrariness of linguistic sign and those concerning the definition and classification of grammatical persons and of pronouns, which parallel the investigations

about performative utterances developed by Austin more or less during the same years (cf. Pragmatics section).

André Martinet (1908–1999) was in the 1930s, a foreign member of Prague linguistic circle; he consistently developed that 'functional view' of language explicitly stressed by the Prague theses (see Prague School section). Natural languages, in Martinet's view, have three features in common: (a) their communicative function, (b) their use of vocal utterances (i.e., natural language is essentially and primarily a vocal phenomenon, and only derivatively a written one), and (c) the double articulation, i.e., a first articulation into significant units ('monemes,' a term borrowed from Frei, but with a somewhat different sense, to replace 'morpheme'), which are in their turn articulated into distinctive units ('phonemes'). One of the most interesting instantiations of Martinet's functionalism is his investigations of diachronic phonology (cf. Martinet, 1955); the 'economy' of sound changes is the effect of the balance of two opposed tendencies, the 'minimal effort' (which tends to lessen sound differences) and 'communicative efficiency' (which tends to multiply them).

Other European Scholars (Guillaume, Tesnière, London School)

The scholars presented in this section, however, certainly influenced by Saussurean thought and hence ascribable to the structuralist trend, nevertheless remained somewhat aside from the debate that developed about the basic tenets of structural linguistics, especially between the two World Wars. This fact occurred also because the most significant works of some of them (e.g., Guillaume and Tesnière) were only posthumously published (see Guillaume, 1971–1990; Tesnière, 1966).

The writings of the French linguist Gustave Guillaume (1883–1960) are often difficult to read and interpret, especially because of the dark philosophical style that shows many influences. That by Henri Bergson (1859–1941) is especially significant in Guillaume's analysis of concept of 'time' (which he does not clearly distinguish from that of 'tense'). Among the several topics dealt with by Guillaume, one can quote his opposition between what is a formal expression in language ('psychosemiotics') and what is expressed by it ('psychosystematics'); only what has a morphophonological representation of its own can be called semiotic. Guillaume also proposed to replace Saussure's terminological pair *langue/parole* with *langue/discours* (speech). Speech necessarily presupposes language: their relationship

can be expressed in terms of the pair 'power' (language) vs. 'effect' (speech).

Lucien Tesnière's (1893–1954) work is especially important for its contribution to syntax. The seminal notion of Tesnière's syntax was that of valency. Tesnière compared the verb to "a kind of hooked atom" that can exert its power of attraction on a smaller or bigger number of 'participant roles' (*actants*). Besides participant roles, the sentence may also contain some 'circumstantial roles' (*circonstants*), which express the conditions of place, time, manner, etc., in which the process described by the verb takes place. Participant roles are obligatory; circumstantial roles are optional. The number of participant roles varies according to the verb class to which the verb belongs, so we have several verb classes according to their 'valency sets.' If Guillaume's linguistic thought did not exert any special influence on subsequent scholars, Tesnière's lies at the origin of several of the most important developments in syntax during the second half of 20th century (cf. Functionalist Schools section).

Among the linguists of the 'London school,' Daniel Jones (1881–1967) and John R. Firth (1890–1960) especially have to be cited. Jones was a phonetician deeply involved in practical questions (such as, for example, the assessment of the principles of phonetic transcription), but he also faced theoretical questions, such as the definition of phoneme. In contrast with the more abstract view held by Trubeckoj (cf. Prague School section), who defined phoneme on an exclusively linguistic basis, Jones opted for a 'physical' definition of phoneme as "family of sounds related in character no member of which occurs in the same phonetic context of any other member." Jones also rejected Trubeckoj's sharp opposition between phonetics and phonology.

Firth's view of language is characterized by the key role it assigned to the notion of context. He defined 'meaning' as 'function in context': not only words and sentences, but even phonetic units have meaning. Firth's contextual approach was especially fruitful in phonology. In his view, phonology cannot be limited to the segmentation and classification of sounds and phonemes ('paradigmatic units'), but must take into account also prosodic, 'syntagmatic' units such as the syllable (hence the name of 'prosodic phonology' given to Firth's theory). It is therefore necessary to study syllabic structure in terms of general sound classes, such as C(onsonant) and V(owel), and of their respective positions. Firth also maintained that grammar (i.e., syntax and morphology) and phonology are interdependent, anticipating in this way positions that will be later held in generative phonology (cf. Generative Phonology section).

Among Firth's students, one may cite R. H. Robins (1921–2000), especially for his historical researches on classical and medieval linguistics, and M. A. K. Halliday (b. 1925), whose 'Systemic Functional Grammar' (see Functionalist Schools section), worked out since the 1960s in successively revised versions, had several important applications in many fields, as artificial intelligence, discourse analysis, or language education.

American Linguistics from 1920s through 1960s

Sapir and His Heritage

American linguistics began to show peculiar features, different from those of European linguistics, from the beginning of 20th century. At that time, mainly because of the influence of the anthropologist Franz Boas (1859–1942), American linguists oriented a lot of their research to the study of Amerindian languages. Because such languages were devoid of written tradition, these scholars were automatically led to adopt a synchronic point of view. Furthermore, given the difficulty of applying the notions of Western grammar to such languages, attempts had to be made at describing them in purely formal ways: this led to the development of 'distributional' and 'classificatory' methods, i.e., based on the observation of pure occurrences of forms.

Edward Sapir (1884–1939) was himself an anthropologist and a linguist at the same time and devoted much of his research to Amerindian languages. His theoretical ideas are expressed in his book *Language* (Sapir, 1921), and in several papers posthumously collected (Sapir, 1949). According to Sapir, language is an 'overlaid function' from a physiological point of view, because it is a psychological and symbolic phenomenon. Hence, a purely physiological view of speech sounds, as was typical of late 19th-century experimental phonetics, is untenable: e.g., English *wh*-sound as in *when, where*, etc., is physiologically identical with the sound produced blowing out a candle, but the two sounds are essentially different, because only the linguistic *wh*- is 'placed' in a system that is composed "of a definitely limited number of sounds." In this way, Sapir arrived at a psychological conception of phonemes and variants.

Sapir's classification of grammatical concepts, on which his new approach to language typology is based, also deserves special mention. He classified them into two main groups: concepts that express 'material content' and 'relational' concepts. Each of both groups is further subdivided into two groups: so one obtains 'basic concepts' (1a), 'derivational

concepts' (1b), 'concrete relational concepts' (2a), and 'pure relational concepts' (2b). Concepts (1a) and (1b) are mainly semantically (or ontologically) based; they are 'objects,' 'actions,' 'qualities' (1a) and their derivations (1b). Gender and number belong to the group (2a), whereas grammatical relations (subject, object, attribute, etc.) belong to pure relational concepts (2b). The possible combinations of the four groups of concepts brings about Sapir's classification of languages into four 'conceptual types.' Type (A) languages only contain concepts (1a) and (2b); those of type (B), concepts (1a), (1b) and (2b); those of type (C), concepts (1a), (2a) and (2b); those of type (D), all four kinds of concepts.

Among Sapir's followers the important contribution of Morris Swadesh (1909–1967) to phonemics (a term that corresponds to the European 'phonology') is to be noted. The most well-known heritage of Sapir's thought is, however, the so-called Sapir–Whorf hypothesis, so called after his name and that of his follower, the nonprofessional linguist Benjamin L. Whorf (1897–1941). According to the theory, our vision of the world is heavily conditioned by our language. This hypothesis is today rejected, especially by those linguists, as generative grammarians, who maintain that cross-linguistic differences are actually more apparent than real. On the other hand, generative grammarians have often reevaluated Sapir's work against Bloomfield's, because of its psychologistic (or mentalistic) approach strongly avoided by the latter.

Bloomfield

Leonard Bloomfield's (1887–1949) behavioristic approach (see especially chap. 2 of Bloomfield, 1933) essentially consists of describing language as a chain of stimuli and responses (S-r-s-R): a speech event takes place when a nonlinguistic stimulus (S; e.g., hunger) produces a linguistic response (r) in the speaker (*give me something to eat!*) and such a response in its turn induces a linguistic stimulus (s) in the hearer, which has as a consequence the hearer's nonlinguistic response (R; e.g., providing food).

Bloomfield's major contribution to linguistics certainly does not lie in this crudely mechanistic view of language function, but instead in the working out of some analytical tools, particularly in the domains of morphology and syntax. The most influential of such tools is the so-called Immediate Constituent (IC) Analysis (see Bloomfield, 1933: chap. 13). In the classical example *Poor John ran away*, the immediate constituents are *Poor John* and *ran away*. The analysis goes on by partitioning *poor John* into *poor* and *John*, and *ran away* into *ran* and *away*. Furthermore, *away* is also analyzed into *a-* and *way*: the principle of immediate constituent analysis applies to morphology exactly in the same way as to syntax. IC analysis was subsequently deepened and formalized, not only by 'post-Bloomfieldian' linguists, but also within generative grammar.

Post-Bloomfieldian Structuralism

Linguists most directly influenced by Bloomfield's thought and analytical techniques especially developed the operational and distributional features of his conception of language. One of the most typical examples of this methodological trend was the so-called prohibition of mixing levels: phonological analysis must precede grammatical analysis and must not assume any part of the latter.

Among post-Bloomfieldian scholars, the following can be quoted, according to the different linguistic domains: concerning phonology, William F. Twaddell (1906–1982), Bernard Bloch (1907–1965), and George L. Trager (1906–1992); concerning morphology and syntax, besides Bloch and Trager, Eugene Nida (b. 1914); a very important intervention in the domain of IC-analysis is due to Rulon S. Wells (b. 1919); possibly, the leader of the group can be considered Charles F. Hockett (1916–2000), who dealt with all such different fields and also worked on theoretical problems, especially in polemics with generative grammar. The most original and influential among American structuralists is, however, Zellig S. Harris (1909–1992): in the 1940s, he was engaged in the deepening and the formalization of Bloomfield's analytical techniques (see especially Harris, 1951); in the early 1950s, he worked out the notion of transformation. In Harris's framework, a transformation is seen as an equivalence relation between two different sentence-forms: e.g., *Casals play the cello* and *The cello is played by Casals*, or *he met us* and *his meeting us* are 'transforms' of each other. The notion of transformation (with important modifications) was to become a cornerstone of generative grammar, especially in its first phases (see later discussion).

Tagmemics and Stratificational Grammar

Tagmemics is the name given to the linguistic theory worked out by Kenneth L. Pike (1912–2000) and his associates and students. It combines both Bloomfield's and Sapir's insights, but it trespasses the boundaries of American structuralism in many respects. The Bloomfieldian side of tagmemics lies in its analytical techniques, which resume, deepen, and modify Bloomfield's. On the other hand, Pike's approach to language is decidedly and explicitly Sapirean:

language is seen as a cultural phenomenon, strictly tied to other cultural manifestations of human life.

Stratificational grammar was developed by Sydney M. Lamb (b. 1929) beginning in the late 1950s. It combines a post-Bloomfieldian approach with some European perspectives, mainly Hjelmslev's glossematics and Halliday's Systemic Functional Grammar. The number of assumed strata varies from two to six, according to the different versions of the theory. Mostly, four strata are assumed: semotactics, lexotactics, morphotactics, and phonotactics. Stratificational grammar aims at giving an account of all kind of linguistic processes, i.e., concerning both competence and performance (see later discussion): it shows, therefore, a 'cognitive' approach that sharply differentiates it from classical post-Bloomfieldian theories and makes it closer to generative grammar, although it is very distant from this latter theory both in the assumed principles and on many technical aspects.

The Beginnings of Typological Linguistics

Language typology was an important field in 19th-century linguistics, but was rather overlooked during the first half of 20th century, because Sapir's work on the topic remained an isolated exception. Things began to radically change in the 1960s, especially stimulated by the work of Joseph H. Greenberg (1915–2001). In Greenberg's perspective (see Greenberg, 1966), a close link is assumed between typology on the one hand and universals on the other. Language universals are no longer exclusively conceived as features that every language *must* possess: to such universals, named by Greenberg 'unrestricted' universals, also implicational universals and statistical correlations have to be added. The most well known instances of implicational universals concern the linear ordering of elements. Greenberg assumed as the bases of his language classification three possible choices: (1) whether a language has prepositions or postpositions ('prepositional' vs. 'postpositional' languages). (2) The position of the verb (V) with respect to the subject (S) and to the object (O). Of the six theoretically possible positions, only three normally occur: VSO, SVO, and SOV. (3) The order of the adjective with respect to the noun it modifies: A (=AN) vs. N (=NA). Such choices are systematically correlated with each other in an implicational way: this implication can be exceptionless or only statistically significant. An instance of the first case is the statement that if a language shows VSO order, it is *always* prepositional (Greenberg's Universal 3). On the other hand, Greenberg's universal 4 is an example of 'statistical correlation': if a language has a normal SOV order, it is postpositional "with overwhelmingly

more than chance frequency." Greenberg's insights caused a tremendous development of typological studies, as will be seen in the Typological Linguistics section.

The Birth and Rise of Generative Grammar

The Origins of Generative Grammar

Generative Grammar (GG) is the label for the linguistic theory developed by the American scholar Noam Chomsky (b. 1928) and his followers; a GG, in Chomsky's own word, is "a system of rules that in some explicit and well-defined way assigns structural descriptions to sentences" (Chomsky, 1965: 8). Chomsky was a student of Harris (cf. previous section), but he early adopted a 'mentalistic' approach to the problems of language and knowledge, highly polemical against the behavioristic one, typical of Bloomfieldian and post-Bloomfieldian linguistics.

The first systematic version of Chomsky's theory appeared in print in a booklet called *Syntactic Structures* (Chomsky, 1957), which was partly an abstract of a much more voluminous work written in the years 1955–56 and published only 20 years later, with some modifications. The main features shown in this book with respect to the tradition of American structural linguistics were the following ones: (1) the goal of linguistic description is no more seen in the analysis of a given corpus, but in the accounting for the intuitions of the native speaker of a given language (well-formedness of sentences, synonymy, etc.). (2) A sharp distinction is traced between linguistic theory on the one hand and grammar on the other. (3) IC-analysis typical of American structuralism (see previous discussion) is formalized in a system of rules called Phrase-structure (PS) grammar. (4) PS-grammar is shown not able to adequately account for all sentences of any natural language. For example, it cannot account for the intuitive relation that any English speaker recognizes between two sentences such as *Mary gave a book to John* and *John was given a book by Mary*, or between the latter and *Who was given a book by Mary?* To account for such kind of relations, it is necessary to postulate a further level of rules, called transformations. This notion was borrowed from Harris, but it is rather differently conceived. Whereas, for Harris, it is a relation between *sentences*, for Chomsky it is a relation between *structures*. This means that the input of a transformation is a sentence in Harris' framework, whereas in Chomsky's one it is an abstract structure often rather remote from the actual sentence that it underlies. The importance given to the notion of transformation in the early phase of GG had the effect that Chomsky's

theory was initially known as transformational grammar rather than as generative grammar (actually, the use of the latter label was rather unsystematic at that time).

The Standard Theory

In the decade 1955–1965, the model of grammar described in the previous section was modified by Chomsky himself and by some of his early associates, such as Charles J. Fillmore (b. 1929), Jerrold J. Katz (1932–2002), Edward S. Klima (b. 1931), Robert B. Lees (1922–1996), and Paul M. Postal (b. 1936). The result of such changes was the so-called (by Chomsky himself) standard theory, presented in Chomsky (1965). The overall structure of the standard model is the following one: PS-rules and lexical insertion rules generate the deep structure both of simple and of complex sentences. The application of transformational rules to deep structure produces surface structures. PS-rules, lexical rules, and transformations form the syntactic component of grammar; deep structures are interpreted by the semantic component, giving the semantic representation of sentences; and surface structures are interpreted by the phonological component, giving the phonetic representation.

In Chomsky (1965), also the 'mentalistic' interpretation of linguistic theory, explicitly defined as 'part of theoretical psychology,' was maintained and argued for in detail. Chomsky opposed competence, defined as "the speaker–hearer's knowledge of his language," to performance, which is defined as "the actual use of language in concrete situations." The linguist has to discover "the underlying system of rules" (i.e., the competence) "from the data of performance" (Chomsky, 1965: 4). A grammar that correctly describes the competence of a native speaker of a given language is said to be descriptively adequate. A linguistic theory is said to be explanatorily adequate if it "succeeds in selecting a descriptively adequate grammar on the basis of primary linguistic data" (Chomsky, 1965: 25). The task of linguistic theory, then, becomes that of accounting for the properties of the LAD (Language Acquisition Device), i.e., the device that allows the child to construct a grammar from among a set of possible alternatives.

Generative Phonology

Generative phonology was discussed in several essays since the late 1950s and found its systematic presentation in Chomsky and Halle (1968). The starting point of generative phonology is that phonology is 'not-autonomous' from syntax: some phonological processes depend on morphological and syntactic

structure. For example, the falling stress contour of *blackboard* is opposed to the rising one of *black board* because the former is a compound, hence belongs to the syntactic category N, whereas the latter is a Noun Phrase. Therefore the rules of assignment of stress contour must refer to syntactic surface structure (cf. Chomsky-Halle, 1968: chap. 2.1.). This is the reason why the phonological component is said to 'interpret' the syntactic component (see previous section). This strict interrelation assumed between the phonological and the syntactic level is quite contrary to the prohibition of mixing levels typical of post-Bloomfieldian structuralism (cf. section on this topic; Pike had already criticized this principle). Generative phonology considered the autonomous approach as a basic flaw of structuralistic phonology, both European and American, labeled 'autonomous phonemics': the notion itself of phoneme as conceived in such frameworks was rejected. Generative phonologists, on the one hand, took advantage from some difficulties in assigning which variants to which phonemes that had already been remarked upon within structuralistic phonology; on the other hand, they maintained that the assumption of an autonomous phonemic level often produces a loss of significant generalizations (the classical case was that of voicing of Russian obstruents, brought forward by Halle). Hence, generative phonology does not assume a phonemic level, but only a phonological representation and a phonetic representation. The former representation is derived from syntactic surface structure by means of readjustment rules; the latter is derived from the phonological representation by means of phonological rules, which apply in a given order. Both phonological and phonetic representations are strings of word and morpheme boundaries and of feature matrices. In such matrices, columns are segments, and rows indicate the value of features. Features of generative phonology only partly overlap with Jakobson's ones (see section on Prague School): their number is higher (about two dozen vs. 12 or 14), and they are mainly defined on an articulatory rather than on an acoustic basis. Features are 'by definition' binary at the level of phonological representation, whereas they are not necessarily binary at the phonetic one. An essential part of generative phonology is the so-called theory of markedness (developing, but also essentially modifying, insights of Prague phonology): features, segments and rules are not on the same plane, but some of them are more natural in the sense that they are more frequent, are acquired by the child earlier than others, etc. This greater or lesser naturalness is accounted for in terms of unmarkedness vs. markedness of the concerned entities and rules.

Since the 1970s, alternative approaches to the strictly segmental or linear model of Chomsky–Halle (1968) have been developed. For example, feature values and segments were no more seen as necessarily in one-to-one correspondence, but it was assumed that in some cases a single feature can extend over more than one segment, and, vice versa, a single segment can subsequently take two opposite values of the same feature (autosegmental phonology). It was also assumed that the domain of application of phonological rules is not only determined by the syntactic surface structure and readjustment rules, but also that the phonological representation has a hierarchic structure of its own, not necessarily coinciding with the syntactic one (prosodic phonology).

The Impact of Generative Grammar

Generative grammar (or, more exactly, generative syntax) aroused great interest among linguists shortly after the publication of Chomsky (1957). This interest became still greater in the subsequent decade, especially after the appearance of Chomsky (1965) and also reached logicians and philosophers of language. Generative tenets were not accepted by everybody: quite the contrary, many of them were sharply criticized. However, the large majority of linguists felt obliged to take a position on them. The following tenets were especially the focus of discussion: (1) The mentalistic view of linguistics (cf. The Standard Theory), which was later called cognitive. (2) The assumption that linguistic theory has to deal with 'an ideal speaker–hearer,' within a 'homogeneous linguistic community': i.e., the social and communicative aspects of language do not influence its structure. (3) The notion of Universal Grammar (UG), resuscitated by Chomsky (1965) with explicit reference to the tradition of *grammaire générale* starting with Port-Royal. From the early 1970s, UG essentially came to mean what he had earlier dubbed the 'language acquisition device' (LAD; cf. The Standard Theory): it was assumed to be universal since it would be shared by all human beings. (4) The postulation of two different levels of representation (deep and surface structure).

It is therefore possible to investigate the development of linguistic trends grown from the last 1960s according to the position they took with respect to the previously listed generative tenets. (1) Chomsky's cognitive view of linguistics was actually opposite the main structuralist trends, both in Europe and America, which conceived linguistics as an autonomous field. This new view was rejected, or at least dismissed as irrelevant, by some strictly formal approaches, such as Relational Grammar (see later

discussion). It was, however, shared by the majority of trends during the last decades of 20th century, but often in a rather different way from Chomsky's. Indeed, although Chomsky simply assumed that to do linguistics *is* to do 'theoretical psychology,' many scholars maintained that linguistic explanations have to be traced back to more general psychological or cognitive factors, or, at least, they must be supported by independent psychological evidence. (2) Chomsky's low evaluation of social and communicative aspects of language contrasted with many earlier linguistic trends, even of the structuralist kind: e.g., Prague school defined language as a 'means of communication.' The view of language as a social phenomenon had been maintained at least since Meillet and it was strongly reaffirmed by scholars such as Uriel Weinreich (1926–1967) as an explicit rejection of Chomsky's views. Other opposition came from the pragmatic approaches to linguistic analysis that were developing within the philosophical tradition. More or less explicitly, all such trends opposed a 'social-communicative' view of language to the 'cognitive' one. (3) A revival of interest in the problem of linguistic universals had been already shown by researches such as Greenberg's; Chomsky's notion of UG clearly developed such interest in an unprecedented way. However, Chomsky's version of UG was not accepted by anybody: the different approaches to language universals were strictly linked with the different views of linguistics as a cognitive science and of relationships between language on the one side and social and communicative phenomena on the other. (4) Also the question of levels of representation was often linked to the problems of linguistic universals: several scholars equated 'deep structure' with UG, and 'surface structure' with cross-linguistic variation. These interpretations were misled, because both 'deep' and 'surface' structure had a specific technical value within a theoretical framework (see, e.g., Chomsky, 1975: 82). Nevertheless, they exerted a not negligible impact even on trends that were very distant from the Chomskyan one. Many of the debates between the different generative schools concentrated on the question if a distinction between whether a 'deep' and 'surface' structure is really necessary and on the nature of the 'deep' level.

In the following sections, trends stemming from generative grammar are distinguished from trends alternative to it. Such a distinction only refers to historical roots: the former trends were worked out by linguists originally (i.e., at the epoch of the standard theory) belonging to the generative group, the latter by scholars outside it. Nevertheless, several trends of the former group eventually became wholly alternative to the generative model.

Trends Stemming from Generative Grammar

Generative Semantics and Its Heritage

Generative Semantics (GS) was worked out between the 1960s and 1970s by scholars such as George Lakoff (b. 1941), James D. McCawley (1938–1999), Paul M. Postal (b. 1936) and John R. Ross (b. 1938). It was sharply opposed to the Extended Standard Theory (EST) by Chomsky and some of his followers. Both approaches shared a realistic view of linguistics and a multilevel approach to syntax, but their way of implementing such ideas was totally different. In their first works, generative semanticists rejected some basic assumptions of the standard theory: according to them, (a) deep structure was a useless concept, and (b) linguistic description must be semantically based. This semantic basis was sought in the reduction of linguistic categories to logical and/or psychological categories: semantic representation should be made to coincide with natural logic. In later works, it was assumed that semantic representation also includes typical semantic and pragmatic categories, such as focus or presupposition.

From the early 1970s, the leading ideas that had characterized the followers of GS were gradually abandoned, and each generative semanticist followed his own way. Lakoff first tried to work out a 'fuzzy' grammar, according to which grammatical categories are not discrete, but form a continuum from the noun at one end to the verb at the other. McCawley moved toward an empirical and somewhat skeptical approach to syntax: contrary to EST, McCawley kept on rejecting any theory of language acquisition that did not take into account general cognitive properties. From this point of view, Cognitive Grammar by Ronald W. Langacker (b. 1942) and his associates could be considered as a legitimate heir to Generative Semantics.

From the middle 1970s, two linguists formerly belonging to the GS group, David M. Perlmutter (b. 1938) and Paul M. Postal, developed a theory called Relational Grammar (RG). RG completely abandoned the notion of transformation as an operation on hierarchically and linearly ordered phrase markers. It also explicitly rejected any aim at being 'psychologically real.' RG takes grammatical relations as primitives and represents clause structure as an unordered set of constituents that bear grammatical relations to each other. Grammatical relations may change from one level ('stratum,' in RG terminology) to another. Strata are not connected by means of transformations, but of Relational Networks, which show which different grammatical relations the constituents bear at different levels.

Fillmore's Case Grammar was often associated to GS, but it is essentially independent from it, even if both approaches wholly replaced the standard notion of deep structure. In Fillmore's view, the 'basic structure' of the sentence consists of the verb and an array of case relationships (see Fillmore, 1968). By 'case,' Fillmore does not mean a morphological category, but an 'underlying syntactic–semantic relationship.' The elements of the basic sentence structure are unordered.

'One-Level' Approaches to Syntax

Generative Semantics pushed the distance between 'deep' and 'surface' structure to its extreme, by identifying deep structure with semantic representation. RG preserved a multilevel approach to syntax. From the middle 1970s, other linguistic trends originated that took the opposite path, giving up the distinction between deep and surface structure and assuming a single level of syntactic representation. The first systematic proposals in this direction are due to Michael K. Brame (b. 1944). The most successful of such 'one-level' approaches were, however, LFG (Lexical–Functional Grammar) and GPSG (Generalized Phrase Structure Grammar). LFG was initiated by Joan Bresnan (b. 1945), a former Chomsky graduate student, and GPSG by a British scholar, Gerald Gazdar (b. 1945), who was later joined in his research program by other British and American linguists. On the one hand, GPSG and LFG share several assumptions: e.g., both avoid transformations and resort to other techniques to solve problems that standard theory dealt with in transformational terms. On the other hand, they originated from and developed with rather different goals and concerns. LFG's original goal was the search for a 'realistic' grammar. GPSG was worked out mainly on the basis of formal concerns and had no special interest in building a 'psychologically real' grammar.

From EST to the 'Minimalist Program'

The syntactic theory worked out by Chomsky and his closest associates in the period from the late sixties until now had as its primary goal that of implementing the notion of Universal Grammar: the development of an adequate model of UG was seen as the proper goal of the cognitive view of language. This theory was called, during the 1970s, Extended Standard Theory (EST); in the 1980s, Principles and Parameters Theory (P&P) or 'Government-Binding Theory' (GB-Theory); from the early 1990s, the Minimalist Program (MP). Three works of Chomsky's could be considered the landmarks of each of these three phases: Chomsky (1973) for EST; Chomsky (1981) for P&P; and Chomsky (1995) for MP.

EST's main concern was the definition of restrictions on the functioning and on the format of syntactic rules. The first, decisive, step in this direction was the system of conditions on transformations of Chomsky (1973). More or less in the same period, Joseph E. Emonds (b. 1940) and Ray S. Jackendoff (b. 1945) formulated some important constraints on the format of transformational rules (Emonds) and phrase structure rules (Jackendoff). The great abstractness of all such conditions was assumed to be the proof that they could not possibly have been taught by adults or inductively discovered by the child. They were assumed to belong to Universal Grammar, namely the 'innate biological system' that is "invariant about humans" (Chomsky, 1975: 29). The innateness hypothesis, of course, contrasts with the actual cross-linguistic diversity. The Principles and Parameters approach was the first real effort made within the Chomskyan program to provide a systematic account of cross-linguistic differences. The universal features of language were dubbed principles, and the dimensions along which languages can vary, parameters. For example, the fact that a sentence in any language must have a subject would be a principle: but in some languages (e.g., Italian, Spanish, etc., as opposed to English, French, etc.) the subject may be 'null,' i.e., not phonetically realized. This option is called the 'null-subject-parameter': it has 'positive value' in Italian or Spanish, 'negative value' in English and French. Although principles are innate, the values of parameters are to be fixed on the basis of experience. 'Principles and Parameters' approach stimulated an amount of research much larger than anything previously done within any other framework connected with generative grammar. In particular, the notion of parameter stimulated cross-linguistic investigation of several languages.

Chomsky, however, was more interested in the depth than in the breadth of explanation (in a sense, more to explanatory adequacy than to descriptive adequacy) and since the early 1990s developed the 'Minimalist Program.' The leading criterion of MP can be considered that of economy, namely resorting to the least possible number of entities and of levels of representation. Therefore, MP disposed of the levels of 'deep' and 'surface structure' and assumed Phonetic Form (PF) and Logical Form (LF) as the only levels of representation. Nevertheless, MP cannot be equated with 'one-level' approaches discussed in the preceding section. In fact, also this last version of Chomskyan generative syntax essentially assumes a very abstract relation between the phonetic and the semantic side of language: PF and LF are related by the computational system, i.e., a transformational apparatus. One of the main goals of MP is just to show *why* transformations exist: *prima facie*, they would seem to be antieconomical. The answer is that they exist to replace uninterpretable features, which are also antieconomical: by so doing, both imperfections erase each other. Natural language is therefore a perfectly economical system, and from this point of view, Chomsky maintains, it is very rare among other biological systems.

Trends Alternative to Generative Grammar

Functionalist Schools

The common feature of functionalism is the assumption that language structure is conditioned by its function as a means of communication. This approach was already taken by some structuralist scholars, such as Martinet, and especially the founder of Prague school, V. Mathesius, who distinguished between the formal (i.e., the grammatical) and the actual (i.e., the communicative) partition of the sentence. Mathesius's insights were taken over by Prague linguists of the subsequent generation, such as František Daneš (b. 1919) and Jan Firbas (1921–2000), who coined the term Functional Sentence Perspective to mean Mathesius's actual partition.

From the 1960s, the most significant functionalist schools developed as an explicit alternative to the formal paradigm of generative grammar: Functional Generative Description (FGD), mainly worked out by Petr Sgall (b. 1926) and his associates, which represents a further stage of Prague School linguistics; Simon Dik's (1940–1995) Functional Grammar (FG) and Halliday's Systemic Functional Grammar (SFG). FGD proponents did not reject generative grammar as a whole, but maintained that it was too partial as an approach to language; on the other hand, they considered exclusively pragmatic approaches to be partial as well.

Despite their differences, all these functionalist schools share an important common core, the main points of which are the adoption of (a) Functional Sentence Perspective, and (b) a kind of Tesnière's valency grammar, in its original form or mediated through Fillmore's Case Grammar. Hence, their fundamental problem was to work out a device to explain the relationship between the system of Tesnière's roles (or Fillmore's 'deep cases') and the grammatical and communicative organization of the sentence.

Typological Linguistics

Typological linguistics since the early 1970s, mainly developed as an attempt to explain word order

correlations stated by Greenberg (see the section titled 'The Beginnings of Typological Linguistics'), and it gradually replaced purely syntactic explanations with semantically and pragmatically based ones. It is therefore independent from generative grammar both in its origins and in its achievements. However, some insights stemming from generative grammar influenced typological studies, especially in the 1970s. For example, Winfred P. Lehmann (b. 1916) started from a syntactic model analogous to that of Fillmore's Case Grammar. He assumed an unordered 'underlying structure,' to be converted into a linearly ordered one by a rule with phrase-structure format: therefrom VO-languages vs. OV-languages would result (cf. Lehmann, 1973).

The most significant development of Greenberg's proposals about word order universals is due to John A. Hawkins (b. 1947), who showed that cases that appear as exceptions in Greenberg's treatment are actually not exceptions, if Greenberg's universals are reformulated in a 'complex' form. An example of such reformulation would be the following: "if a language is SOV, then, if it has AN order, it has also GN order" (cf. Hawkins, 1983: 64).

Two other key notions developed in the framework of typological linguistics, especially by Edward S. Keenan (b. 1937) and Bernard Comrie (b. 1947), are continuum and prototype: categories are no more defined, as in generative grammar, in terms of possessing or not possessing a given property, but as clusters of properties. If all such properties occur, the concerned category is 'prototypical'; the deviations from the prototype are distributed along a 'continuum.'

Sociolinguistics

The label 'sociolinguistics' was firstly used in 1952 by the American Haver C. Currie (1908–1993), but it became widespread from about the late 1960s. In the last decades, this label ended in indicating a variety of researches, both of theoretical and applied kind, from 'ethnography of speaking' to 'language policy.' Between the 1960s and the 1970s, however, a sociolinguistic trend presented itself as an alternative approach to generative grammar.

The leader of this trend undoubtedly was William Labov (b. 1927), to whom the notion of variable rule is due. Variable rules have the format of PS-rules of generative grammar (more exactly, of *context-sensitive* PS-rules): their application or nonapplication, however, is not *categorical*, but it is conditioned by some probability factors, both of linguistic and extralinguistic (i.e., social, stylistic, regional) kind. By resorting to the device of variable rules, Labov was able to account for the different realizations of the same grammatical phenomenon across different

social groups (a paradigmatic case was that of the contraction vs. deletion of the copula *be* in white vs. black American English speakers; see Labov, 1969).

The status of variable rules became a topic of intensive discussion. Do they belong to competence or to performance? Labov initially assumed that they are part of competence, but he eventually (in the 1970s) rejected the usefulness of such distinction. On the other hand, a radical revision of Chomsky's notion of competence had been proposed in 1968 by Dell Hymes (b. 1927), who replaced it by that of communicative competence, which indicates the speaker's ability to use language according to the different social and contextual situations. It can be remarked that, since the EST period, also Chomsky referred to a 'pragmatic competence' interacting with the grammatical one. Hence, the problem is whether grammatical competence is independent or not from 'pragmatic' or 'communicative' competence: Chomsky's answer was affirmative, whereas that of sociolinguistics and pragmaticists, negative.

Pragmatics

From the 1960s, pragmatics presented itself as an alternative to the Chomskyan view of language as a cognitive capacity fully independent from its use. Indeed, the roots of pragmatics lay earlier than generative grammar: the term had been created in 1938 by the philosopher Charles W. Morris (1901–1979) and the research field had as its initiators, between the 1950s and the 1960s, two British philosophers of language, John L. Austin (1911–1960) and H. Paul Grice (1913–1988) (neither of whom, however, used the word *pragmatics*). Austin maintained that speech is action (cf. Austin, 1962). The primary evidence for this is given by the utterances called performative by Austin, such as *I promise you to come*, by means of which I am not only *saying* something, but also *doing* it. Performative utterances are a kind of illocutionary act: examples of illocutionary acts are question, order, etc. According to Austin, a speech act, besides the illocutionary act, consists of the locutionary act (the uttering of given words and phrases) and the perlocutionary act (the intended effect of the speech act on the hearer). This classification of speech acts was partly revised by John R. Searle (b. 1932).

The original motivation of Grice's 'logic of the conversation' (which dates back to essays from the 1950s, eventually collected in Grice, 1989) was to show that there is no real divergence between the meaning of symbols such as $\sim$, $\forall$, $\exists$, etc., of formal logic and their counterparts *not*, *all*, *some*, etc., in natural language: the apparent differences of meaning are due to certain principles governing conversation, the conversational maxims. If I utter a sentence such

as *Some students passed the examination*, I am undoubtedly saying the truth, even if *every* student did in fact pass the examination, but the hearer normally interprets it as meaning that only some students, and not all of them, passed the examination. This is due to the fact that I have violated the 'maxim of quantity': "make your contribution as informative as is required" (cf. Grice, 1989: 26). From my violation, the hearer has drawn the conversational implicature that only some students, and not all, passed the examination.

The analysis of speech acts and of logic of conversation are still today at the center of interest of pragmaticists. The interest in conversation also made pragmatics include a good deal of text linguistics, which originally started as a project to extend formal techniques of generative kind to units larger than sentences. In recent decades, text linguistics seems to have been replaced by the more empirical and informal conversational analysis, initiated by sociologists such as Harvey Sacks (1935–1975) or Harold Garfinkel (b. 1929), but later adopted by pragmatics-oriented linguists.

See also: Phoneme; Autosegmental Phonology; Benveniste, Emile (1902–1976); Bloomfield, Leonard (1887–1949); Case Grammar; Chomsky, Noam (b. 1928); Cognitive Grammar; Cognitive Science: Overview; Distinctive Features; Firth, John Rupert (1890–1960); Functionalist Theories of Language; Generative Grammar; Generative Phonology; Generative Semantics; Halle, Morris (b. 1923); Halliday, Michael A. K. (b. 1925); Harris, Zellig S. (1909–1992); Hockett, Charles Francis (1916–2000); Jakobson, Roman (1896–1982); Labov, William (b. 1927); Lexical Functional Grammar; Martinet, André (1908–1999); Minimalism; Nida, Eugene Albert (b. 1914); Phonemics, Taxonomic; Prague School; Principles and Parameters Framework of Generative Grammar; Saussure, Ferdinand (-Mongin) de (1857–1913); Saussure: Theory of the Sign; Structuralism; Structuralist Phonology: Prague School; Systemic Theory; Tagmemics; Tesniere, Lucien Valerius (1893–1954); Trager, George L. (1906–1992); Transformational Grammar: Evolution; Trubetskoy, Nikolai Sergeievich, Prince (1890–1938); Valency Grammar.

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Two-Dimensional Semantics

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When we ask whether a sentence is true or false, we are always asking with respect to a particular world. We are typically concerned about a sentence's truth value in the actual world, but we sometimes consider its truth value in other possible worlds as well. Thus the evaluation of any sentence is world-dependent in the sense that whether it is true (in a world) depends on the facts about that world. Context-sensitive sentences are also world-dependent in another quite different sense – what they mean depends on facts about the context, or world, in which they are used. For instance, *it's cold here* uttered in Pakistan means that it is cold in Pakistan, and when uttered in New Jersey means that it is cold in New Jersey. Two-dimensional semantics uses a formal apparatus from two-dimensional modal logic to characterize these two kinds of world-dependence. The two-dimensional framework has been applied to a variety of problems in semantics (indexicals and demonstratives and their interaction with modal operators), pragmatics (presupposition), and philosophy (accounts of the *a priori/a posteriori* distinction and the psychological/functional roles of thought). All of these applications depend on various assumptions, which are not implicit in two-dimensional modal logic, and many of which are controversial.

Modal logic allows that expressions may have different extensions in different possible worlds. For instance, it allows that the objects that satisfy a predicate in one world may differ from those that satisfy it in another. In one-dimensional modal logic, the rule that determines each expression's extension in every world, called its intension, is represented as a function from possible worlds into extensions. The intension of a predicate F, for instance, is a function that takes a possible world onto the set of individuals that satisfy F in that world, and the intension of a singular term *t* is a function taking possible worlds to single individuals. Two-dimensional modal logic allows that a single expression may be associated with different one-dimensional intensions in different contexts, or worlds, of use. So it associates a two-dimensional intension with each expression, which is a function from possible worlds to one-dimensional intensions, or equivalently a function from ordered pairs of possible worlds into extensions (see Segerberg, 1973; Aqvist, 1973; van Fraassen, 1977 for expositions of a two-dimensional modal semantics for formal languages).

Since a two-dimensional intension takes pairs of possible worlds onto extensions, it has the resources to represent the two different kinds of world-dependence mentioned above. One of the worlds supplies the contextual elements needed to interpret context-sensitive expressions, and the other world supplies the context of evaluation. I will call the entity that plays the former role the world of occurrence, and the entity that plays the latter role the world of evaluation, although no terminology is standard.

Two-dimensional intensions can be represented in a matrix such as **Figure 1**, which gives a two-dimensional intension for a single expression, s. In the leftmost column of **Figure 1**, w^1, w^2, and w^3 represent possible worlds considered as worlds of occurrence. In the top row, these same three worlds are considered as worlds of evaluation. Suppose that s is the sentence *I am in San Francisco*. In w^1, Ann is the speaker of this sentence and Ann is in San Francisco. She is also in San Francisco in w^3, but not in w^2. In w^2, Beth is the speaker, but she is in London in all three worlds. In w^3, Carl is the speaker, and Carl is in San Francisco in all three worlds. The cells of this matrix are filled in with truth values, since this is the appropriate extension for sentences. The row corresponding to w^1 tells us the truth value, in w^1, w^2, and w^3, of the sentence s, considered as occurring in w^1. In w^1, Ann utters this sentence, so it is true just in the case where Ann is in San Francisco. Accordingly, this occurrence is true in w^1 and w^3, but false in w^2, as the matrix indicates. Similarly, the row

s	w^1	w^2	w^3
w^1	T	F	T
w^2	F	F	F
w^3	T	T	T

Figure 1 Two-dimensional matrix.