Chomsky's century
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One of the greatest and best-known personalities of the world of science, Noam Avram Chomsky turned eighty in December 2008. His influence on the scene has been continuous and possibly immeasurable in the past fifty years. In 2005, for example, two respectable magazines, *Foreign Policy* and *Prospect*, one from the USA, the other from the UK, asked their readers who they considered to be the most influential intellectual in the world: Chomsky came in first, Umberto Eco a distant second.

What's the secret? – is usually the question mediocre interviewers usually ask their subjects in fields as diverse as arts and science. While it is difficult to find out whether Chomsky was ever asked this question, since he has been so patient in replying not only to the several knowledgeable linguists who interviewed him about fundamental issues in the trade, but also to all the journalists who had inquired about both his linguistic theorizing and his political credo, it is certain that his life is an open book: he never hid his linguistics, let alone his politics from the public eye, and even his home address is available from the net. He is still at his very first workplace, The Massachusetts Institute of Technology, he has always been married to Carol Schatz, the student he met while at college, and they have never moved from their first suburban home. His political and linguistic views have also remained constant: he follows the same principles he espoused while in fourth grade at elementary school, when he got disgusted by the events of the Spanish Civil War, and he has the same view of language and the mind that he had when he wrote and defended his PhD dissertation in 1955.

Chomsky consciously committed himself during the (previous) economic crisis to a leftist anarcho-liberalist philosophy, but became a linguist by accident. His parents enrolled him in a unique school in Philadelphia, where instruction was free-spirited, with no subjects or grades, thus no competition between the pupils. Everyone could proceed according to his or her needs and capacities, and probably this freedom was one of Chomsky's defining experiences. Another may have been due to growing up as a member of the only Jewish family in a neighborhood of Philadelphia full of Irish and German Catholics who sympathized with Anti-Semitism in an age when it was not certain whether the then ubiquitous Fascism was not to prevail even in the United States. Suffering from violence in the streets was thus an essential and very personal experience.

The beginnings
He arrived at the prestigious „Ivy League" University of Pennsylvania at 16, but he became bored very soon, for the classes offered no challenging problems, thus hardly any intellectual pleasure. After two years he was about to quit when, on his father's advice, he began to attend Zellig S. Harris's classes, who was one of the most significant linguists of the era and the founder of the first department of linguistics in the USA, only because Chomsky sympathized with his political credo. For a start Harris asked him to proofread his new book,[1] hardly an easygoing introduction to the novice, so that was Chomsky's first encounter with linguistics.

The then predominant trend held the view that languages differed from one another in infinite and unpredictable ways. The task of linguistics was to produce "discovery procedures", which made it possible to describe individual languages on the basis of corpora or large bodies of actual stretches of physical recordings of linguistic utterances, by exploring the occurrences of sounds or phonemes (and their varieties or allophones), morphemes (and allomorphs), and larger constituents in their environments. Their lists and the generalizations formed along the way, such as the constructional patterns were to form the grammar of a

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[1] Harris (1951)

language. Among the various consequences of this approach are the "direct" method of second language teaching, the corroboration-based view of first language learning, and the stimulus-response model for linguistic meaning in behaviorist psychology.

Chomsky's 1955 doctoral dissertation[2] broke with this tradition so radically and with such a success that after two decades structuralist (or descriptive) linguistics was basically a thing of the past. But we would be too naive to believe that the practitioners of the field were simply won over by this voluminous work – hardly so, considering that it was published 20 years later, and even then not the full copy.

No, the story had a different sequel. When the unknown author had been turned down by major publishers and thus failed to publish his thick dissertation, Chomsky was offered a job at the Massachusetts Institute of Technology and he put together a set of lecture notes based on a few chapters of his thesis for students of engineering. Having seen the manuscript, his colleague Morris Halle called his attention to a new series by a publisher in The Hague, Mouton, whose first volume was by Halle and Roman Jakobson, the grand old man of general linguistics then and for almost three more decades.[3] The fourth book in the *Janua Linguarum* series was to be Chomsky's *Syntactic structures*, which has become the keystone of modern linguistics. In order to fit the label of the series, retroactively, as it were, it opened the gates to a new way of thinking about language and languages, perhaps precisely because it was short and relatively easy to access. It became highly popular with linguists to literary scholars, to mathematicians, to engineers.

The theory
The central thesis of the book, which had such an overwhelming effect, was the idea that grammars, the rules that determine languages cannot be "discovered" by any procedure from closed corpora since the number of possible sentences in a language exceeds any numerical limit. For example, any sentence can be augmented by a relative clause, which can be supplemented by another one, and so on, practically *ad infinitum*, cf. *The boy who saw that girl who hit the man who knew the teacher who ...* Do not be misled by the "emptiness" of the content of this string of words; the exercise points at the capacities that inhere in the rules that determine language, which in turn makes it possible to create an unlimited variety of "meanings". This "recursive" property of language is the fundamental principle that has accompanied Chomsky from the very start. In a recent paper coauthored with evolutionary biologists he attributes the decisive factor of the evolution of language to this very feature.[4]

The 120-page book produced just one of the cracks in the building of descriptive linguistics. Chomskyan linguistics did not have to take the long way outlined by Max Planck in the following famous quote: „A scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it." (Planck 1950: 33–34). But Chomsky could make a shortcut; he happened to take part in 1958 at a conference in Austin, Texas, where he convinced not, or not primarily, his fellow linguists, but the students, who then turned away from traditional and descriptive linguistics and changed their allegiances to generative grammar, as the new school was to be called. The debate is well documented in the transcript published a few years later.[5]

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[2] Or rather the book that formed the basis of it: Chomsky (1955/1975). He submitted a few chapters of the book as his thesis (Newmeyer 1986).
[3] Jakobson and Halle (1956),
[4] Chomsky et al. (2002).
[5] Hill (1962)

It is hardly surprising that Chomsky's political philosophy is related to his theory of language. For if we believe with the descriptivists that the unlimited variety of languages cannot be derived from some principle common to all of them, that each language can be radically different from every other language (discounting genetic relations exhibited in "family trees"), or that the child acquires its native language in response to the stimuli in its environment, as, e.g., B.F. Skinner claimed,[6] then we would have to admit that there can be differences between individual specimens of human beings as defined by their environments, resulting possibly in diverse intellectual capacities.

On the contrary, a genetically given uniform language faculty, first dubbed competence, and more recently as internalized (or I-) language, is endowed in every child, and they only have to encounter language data in their environment in order to set in motion the "language acquisition device", which will create the mental organ that, among other things, can produce an unlimited number of sentences. The creative use of language is what underlies the uninhibited freedom of thought available to all human beings, and ultimately the liberty of humankind.

In contrast with the I-language, the external (or E-) language is identical with the traditional notion of language: the (set of sentences of the) English, German, Japanese, etc. language, the physical (auditory, visual) data produced or perceived. These "facts", however, are, if at all, of minor importance as compared to the fundamental properties of language, much like the individual plumage of birds of the same species, which may differ in color or shape.

This view of language is debated even more passionately than Chomsky's original ideas, but it must be granted by everyone concerned that it has initiated (or provoked) directions of research that have revealed a great deal about the biological determination of language, the process of language acquisition, or the relationship between language and the brain/mind. It is due to Chomsky's theory of language that during the past two millennia of the discussion of language it has now become possible to approximate the explicitness and rigor of natural sciences: we can formulate principles and derive propositions from them, collating them with empirical data. In other words, linguistics has a chance now to be a truly theoretical discipline.

Consequences
Due to Chomsky's research program it is now possible to give more and more sensible answers to the questions originally raised by Ferdinand de Saussure not long after the turn of the previous century. Saussure (1916) regarded language (*la langue*) a system of signs, but he took words to be the basic signs and had in fact very little to say about the system itself, beyond introducing the, certainly revolutionary, method of the formal classification of elements. Before Saussure the building blocks, the categories of language had been defined predominantly with reference to their meanings: nouns were names of things, people, etc, verbs were names of actions, events, etc. In post-Saussurean linguistics these categories are defined with reference to their environments in some larger context, i.e., in relation to other words or classes of elements. This was the point of his analogy with the game of chess: it is all the same what particular shape a piece has as long as the players are aware of its role in the game.

But this reveals us precious little of what the primary signs of language are or what kind of a system language is. While the former question has become the realm partly of semiotics, which clearly has Saussurean roots, and partly of the philosophy of language from the Stoics through Locke, the latter problem was for Chomsky to deal with.

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[6] See Skinner (1957), and Chomsky's scathing criticism of it (Chomsky 1959).

He has consistently followed the Saussurean teaching that "language is form, not substance".[7] His theory is a network of formal relations in which constituent units (words, categories, and their classes) are determined by their relationships to one another. The basic unit of analysis is the sentence, rather than anything smaller than that, and the sentence is constructed ("projected") from the syntactic, semantic, etc. information that is encoded in words (or "lexical units"). The task of grammar is to spell out these relations fully and explicitly, i.e., in a "generative" manner. Consequently, all linguistic phenomena are to be described as a function of structure: "structure-dependence" is a pervasive principle of contemporary linguistics.

Such a theory has to be deductive and exhaustive, as was stipulated in Chomsky's earliest writings. But the final outcome is not the description of some "Platonic abstraction", but a characterization of the human language faculty: the enumeration of all those principles that define the genetically given "language module". These hypotheses or requirements are interesting even if it turns out in the end that there is no independent or autonomous "language module" in the brain/mind, because it is empirical enough to find data contradicting it or forge counterarguments against it, that is, it is "strong" enough to be refuted in principle. And while refutations are being devised, a host of new problems arise that cry out for alternative theories to accommodate them – much in the fashion of well-established disciplines in natural sciences.

It was Chomsky's sentence-based approach that made it possible for linguistic semantics to move out of the impasse caused by having concentrated solely on the word, and connect with the advances made in logic and the philosophy of language since Frege's seminal articles and his followers' work mostly in Cambridge and Oxford at the beginning. Thus notions such as presupposition, quantifiers, definite, specific and indefinite nominal expressions, reference, modal and tense logic, etc. were all easily accommodated in the bounds of the new linguistics.

Perhaps even more significant is the achievement of generative linguistics that it could raise radically new and intriguing problems that moved the discipline miles ahead into new directions. A theory is attractive not only because it can provide new accounts for phenomena long known: in fact, it is not easy to decide between competing theories on this criterion alone. It may be a much more important question whether it can generate new problems. And it is this aspect of Chomsky's theory that has paramount significance, i.e., the fact that it provides a framework for asking incomparably more, as well as more varied questions than any of the alternative approaches.

There are disciplines in social sciences and the humanities that shed their skin every ten or fifteen years and appear in a new disguise. They regularly change their theoretical framework not because the old one had been disproved, but because it has become ineffective, powerless, or impotent. Chomskyan linguistics is not such a short-lived fad; it has steadfastly held its positions for the past fifty-odd years. All other competing theories in cognitive science, language acquisition, evolutionary biology or psychology define themselves in relation to generative linguistics, and address prob0lems raised in Chomskyan linguistics.

And Chomsky himself moves on along his original principles. As he formulated over twenty years ago, he is intrigued by two opposing questions. He called the first one "Plato's problem" and had taken it over from Bertrand Russell: "How comes it that human beings, whose contacts with the world are brief and personal and limited, are nevertheless able to know as much as they do?" – with reference to the accumulation of reliable knowledge in the sciences. He calls the other one "Orwell's problem" and it is concerned with "why we know and understand so little, even though the evidence available to us is so rich" – referring to the

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[7] "La langue est une forme et non une substance." (Saussure 1916: 169)

practice of totalitarian regimes as well as how consent is "manufactured" in democratic societies. (Chomsky 1986)

There is a single picture hanging on the wall in Chomsky's office at MIT, the philosopher Bertrand Russell's, who turned away from his own discipline to pursue political objectives. Chomsky has never contemplated making this move; he had rather decided to follow another great philosopher's, Karl Popper's lead: "I see in science one of the greatest creations of the human mind. It is a step comparable to the emergence of descriptive and argumentative language, or to the invention of writing. It is a step at which our explanatory myths become open to conscious and consistent criticism and at which we are challenged to invent new myths."[8] It is this attitude to critical thought that Chomsky would have us all practice, even if it is directed at his own work.

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[8] Popper (1972: 84)