CHOMSKY, Noam Avram (1928-)

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Noam Chomsky was born to Dr. William (Zev) Chomsky and Elsie Simonofsky in Philadelphia on December 7, 1928. His father emigrated to the United States from Russia. William was an eminent scholar, author of the study *Hebrew, the Eternal Language* (1957), as well as numerous other works on the history and teaching of Hebrew. Noam entered the University of Pennsylvania in 1945. There he came in contact with Zelig Harris, a prominent linguist and the founder of the first linguistics department in the United States (at the University of Pennsylvania). In 1947 Chomsky decided to major in linguistics, and in 1949 he began his graduate studies in that field. His BA honor's thesis *Morphophonemics of Modern Hebrew* (1949, revised as an MA thesis in 1951) contains several ideas that foreshadow Chomsky's later work in generative grammar. In 1949 he married the linguist Carol Schatz. During the years 1951 to 1955 Chomsky was a Junior Fellow of the Harvard University Society of Fellows, where he completed his PhD dissertation entitled *Transformational Analysis* (1955; published as part of *The Logical Structure of Linguistic Theory* in 1975).

Chomsky received a faculty position at MIT in 1955 and he has been teaching there ever since. In 1961 he was appointed full professor in the Department of Modern Languages and Linguistics; the graduate program in linguistics began the same year. In 1966 he was appointed Ferrari Ward Professor of Linguistics. In 1976, the linguistics and philosophy programs at MIT were merged and the Department of Linguistics and Philosophy was created; this has been Chomsky's home department ever since.

Alongside his career as a linguist, Chomsky has been active in left-wing politics. In 1965 he organized a citizen's committee to publicize tax refusal in protest to the war in Vietnam; four years later he published his first book on politics *American Power and the New Mandarins*. By the 1980's he had become both the most distinguished figure of American linguistics and one of the most influential left-wing critics of American foreign policy. He has been extremely prolific as a writer: his web-site in 2003 listed 33 book publications in linguistics (broadly construed), and although the individuation of his

political books is complicated, their number definitely exceeds 40. According to a 1992 tabulation of sources from the previous 12 years in the Arts and Humanities Citation Index, Chomsky was the most frequently-cited person alive, and one of the eight most frequently-cited authors of all time.

Chomsky's intellectual life had been divided between his work in linguistics and his political activism, philosophy coming as a distant third. Nonetheless, his influence among analytic philosophers has been enormous due to three factors. First, Chomsky contributed substantially to a major methodological shift in the human sciences, turning away from the prevailing empiricism of the middle of the twentieth century: behaviorism in psychology, structuralism in linguistics and positivism in philosophy. Second, his groundbreaking books on syntax (Chomsky (1957, 1965)) laid a conceptual foundation for a new, cognitivist approach to linguistics and provided philosophers with a new framework for thinking about human language and the mind. And finally, he has persistently defended his views against all takers, engaging in important debates with many of the major figures in analytic philosophy (Tyler Burge, Donald Davidson, Michael Dummett, Saul Kripke, Thomas Nagel, Hilary Putnam, Willard Van Orman Quine, John Searle, to cite a few) throughout his career.

Traditional linguistics produced recommendations about socially acceptable forms of speech, guidelines for learning hitherto unknown languages, hypotheses about the origin and development of vernaculars, and a large amount of useful data concerning their current and actual phonology, morphology, syntax and semantics. It is hard to avoid the impression that there is no unified subject matter here. Cognitive linguistics, as Chomsky conceives of it, is the study of the language faculty of individual human minds (and ultimately brains). The key observation is that having a language is a *species property* of *homo sapiens*, both in the sense that linguistic *competence* (what speakers of a language know in virtue of being speakers) is remarkably uniform across members of our species, and in the sense that a similar competence cannot be found among members of other species. The uniformity of linguistic competence among humans had been obscured by excessive focus on the diversity of linguistic *performance* of speakers (facts about their actual linguistic behavior) and on the diversity of languages spoken in the world. But, according to Chomsky, brute observation of speaker behavior is a poor guide

in linguistics and underneath the apparent diversity we can discover universal principles of human languages. The lack of linguistic competence among non-human animals is obscured by the fact that some of them (e.g. bees or dolphins) have the capacity to communicate and by the limited success researchers had in teaching some of them (e.g. chimpanzees and orangutans) to understand simple verbal instructions. But existing systems of animal communication consist of a finite set of symbols, and there is no evidence that animals can acquire much more than that through instruction. Language, on the other hand, has a recursive grammar capable of generating a potentially infinite set of expressions. Although we humans do employ language for the purpose of communication (as well as for the purposes of self-expression, clarification of thoughts, constructing and strengthening social ties, and so on) Chomsky denies that communication is an inherent function of our language and in general rejects the contention that language should be studied in the context of human interactions.

To characterize what is distinctive in his way of specifying the subject matter of linguistics, Chomsky (1986) introduced the distinction between *I-language* and *E-language.* He thinks the proper subject of the study of language is the former: a natural object *i*nternal to the brain of an *i*ndividual whose working is representable as a function-in-*i*ntension generating structural descriptions of (as opposed to mere strings of) expressions. I-language is to be studied in a way in which we might approach, for example, the visual system. In both cases the systems produce representations employed to facilitate thought and action, but their scientific study must abstract away from the relations these representations bear to objects in the world. (An immediate consequence of this is that semantics, insofar as it is thought to investigate language-world relations, must be an ill-conceived enterprise.) By contrast, E-language is something *e*xternal to individuals, either a social object constituted by norms and conventions, or some abstract object, say, a set of sentences. The traditional notion of a language (like Bulgarian or Swahili) and the traditional notion of a dialect (like the Norfolk or the Yorkshire dialect of British English) are of no scientific use. Variations among competent speakers may be considered significant or insignificant for a variety of purposes and there is nothing systematic to be said about these classifications. Chomsky often mentions the *bon mot*

that a language is a dialect with an army and a navy; occasionally he even expresses doubts about the very coherence of the notion of an E-language.

According to Chomsky, the language faculty is part of our biological endowment, and as such it is largely genetically determined. The chief argument for this view comes from facts about language acquisition. According to the *poverty of stimulus argument*, there are many aspects of the linguistic competence of adult speakers that could not have been learned on the basis of the primary linguistic data available for the child during the period of language acquisition (sentences and pseudo-sentences heard along with accompanying gestures and other situational clues). Consequently, these aspects are never learned and must be *innately specified.* Additional empirical evidence for innateness comes from research showing that language acquisition is remarkably fast, devoid of certain sorts of errors we would *prima facie* expect, and comes in characteristic stages whose order and duration seems independent of environmental factors. Chomsky's hypothesis is that language arises in the mind of the child through a realization in the brain of a language faculty, which begins in an *initial state* (also called *Universal Grammar*), goes through a series of intermediate states, and reaches a *steady state*, which is no longer subject to fundamental changes.

The conceptual framework of Chomsky's early work on syntax has been extremely influential among philosophers, to some extent because his distinction between *deep* and *surface structure* seemed to sit well with the tradition within analytic philosophy (going back to Russell's theory of descriptions) that the surface appearance of a sentence often masks its true structure. In Chomsky (1965), grammar is divided into two levels of representation: the deep structure generated by the recursive rules of a context-free phrase structure grammar (this is what makes the grammar *generative*) and the surface structure derived from the deep structure through the application of transformation rules (this is what makes it *transformational*). Much of the subsequent development of the theory in the 1970's can be viewed as a series of attempts to formulate constraints on both the generative and the transformational components. (An example of the former is the development of *X-bar theory*, which specifies a common internal structural skeleton for all phrases; an example of the latter is the proposal to reduce the available movements to the single rule ("*move α*"), whose applicability is then

restricted by a few general constraints.) Although the details underwent considerable change by the end of the 1970's, the fundamental framework remained the same.

Starting with Chomsky (1981), however, the familiar framework was abandoned. Chomsky began to think of Universal Grammar as a system of innate *principles* combined with a certain number of (probably binary) *parameters* whose values are not genetically fixed. Language acquisition is then a process of parameter setting, and the fundamental ways in which human languages differ can be characterized in terms of the values of these parameters. In a complex system with a rich internal structure the change in a single parameter can have a wide variety of consequences proliferating in various parts of the grammar. (What is universal – *pace* parametric variation – according to Chomsky, is syntax. The apparent syntactic variety of human languages is the result of variations in idiosyncratic morphological features originating in the lexicon: inflectional morphemes or functional elements, such as tense and case.) This picture implies a radical methodological shift in the study of language. If the theory is on the right track, the construction of rule systems for particular languages can no longer be regarded as the central task for linguistics. Instead, the structure of *any* particular human language should be studied through the study of human languages *in general*, through uncovering the principles of Universal Grammar and through the identification of parameters whose setting accounts for linguistic variation.

(An example of an innate principle is that all grammatical operation is *structure dependent*; this principle rules out, for example, an operation that would move the second word of a sentence to the front, and thereby accounts for the fact that children tend not to try out sequences such as *"Of glasses water are on the table?" when they seek the interrogative counterpart of "Glasses of water are on the table." An example of an innate parameter is the *head (position) parameter* whose setting determines whether within a phrase the head precedes the complement, as in English, or follows it, as in Korean. Assuming the parameter is binary, the prediction is that there are no intermediate cases: Universal Grammar dictates that in a possible human language that has phrases where the head must come first there cannot be phrases where the head must come last. There are, however, *polysynthetic* languages, like Mohawk, where there is no fixed order. It has

been hypothesized that this is due to another parameter, set one way in Mohawk and another way in English and Korean.)

Chomsky (1993, 1995) has initiated a new research program within the boundaries of the principles and parameters framework. The central idea of *the minimalist program* is the hypothesis that the language faculty is, in a sense, a perfect device. Representations and derivations are in fact as minimal as it is conceptually possible, given the constraints put on them by that they have to interact with the *performance systems* (articulatory-perceptual systems and conceptual-intentional systems). The assumption is that the derivation of sentences begins with a set of items drawn form the lexicon and the *computational system* then attempts to derive a pair of representations, one component of which is a *phonetic form* (PF) and the other the *logical form* (LF). Lexical items are supposed to be bundles of *features*, some of which are formal (e.g. tense), some phonological (e.g. that 'know' is pronounced as /nō/), some semantic (e.g. that 'table' is [artifact]). They are *merged* one-by-one to form successively larger and larger syntactic objects. After a certain point (called *spell-out*) the derivation splits: semantic operations continue without any overt phonological realization to produce LF and phonological operations continue without affecting the meaning of the syntactic object.

The drive behind movement (the reason why a random array of lexical items is typically not grammatical) is the fact that certain *features* are uninterpretable for the conceptual-intentional system, that features can only be erased (the technical term is *checked*) when an appropriate pair of them stand in the right sort of structural relation to one another, and that a well-formed representation must be fully interpreted. This last principle of Universal Grammar is called the *principle of full interpretation.* (For example, the reason the string *"He not loves her" is ungrammatical is that the third person singular nominative features of the verb cannot be checked by the subject separated from it by 'not'. So, the relevant features of 'loves' move out of their position, carrying with them the phonetic features corresponding to '-s' as well, and attach themselves to the auxiliary 'do' appropriately related to the subject resulting in 'He does not love her'.) Movements are constrained by *economy principles*, which require, in effect, that they occur only as a last resort and in a manner that requires the least effort.

If anything counts as surface form in this picture, it must be the phonetic form. Everything else (including the logical form, which is *not* conceived of as a formula of some preferred formal language whose inferential properties match the inferential properties of the derived sentence) counts as "deep". And, as Chomsky has repeatedly emphasized, the surface grammar of philosophical analysis has no status whatsoever.

Given his characterization of language as a system of knowledge – his willingness to downplay the significance of actual performance, to emphasize the creative aspect of language use, to endorse innate principles of grammar, and to postulate structure invisible on the surface – Chomsky is rightly regarded as an heir to the rationalist tradition in the philosophy of language and mind. He himself has often emphasized his indebtedness to such a tradition, especially to the *Port-Royal Grammar* and to Humboldt; cf. esp. Chomsky (1966). But there are important aspects in which Chomsky's views diverge from the rationalist picture. First of all, in speaking about linguistic competence he is willing to consider a kind of knowledge that is (although innate) not based on reason. In fact, the very idea of a justification for a certain aspect of our competence seems out of place. Second, he does not think that Universal Grammar bears any interesting relation to the structure of reality. Moreover, he does not think that Universal Grammar evolved under any particular evolutionary pressure that interaction with our environment may have created. Third, given his radical internalism about language, Chomsky rejects semantic theories that are based on truth and reference and consequently require the study of language-world relations. In doing so, he forfeits a major part of the rationalist enterprise, namely, the justification of logical inference (that is, the justification of the *truth*-preserving character of such inferences) on the basis of the postulation of an underlying logical form.

There is a final, crucial respect in which Chomsky breaks with the rationalist tradition. Rationalism in philosophy knows no fundamental obstacle to the expansion of human knowledge; it is the empiricists who have placed special emphasis on the limits of thought by insisting that experience places severe constraints on concept formation. Being an innatist, Chomsky does not believe in empiricist constraints on thought – he advocates his own conception of limitations instead. He has often spoken of a *science-forming faculty* conceived along the same basic lines as the language faculty. The

fundamental principles of the science-forming faculty are genetically encoded and environmental factors permit only minor variations. Just as rats seem genetically incapable of dealing with certain mazes, humans may well be barred from unlocking some of the secrets of nature. He calls questions within the scope of the science-forming faculty *problems*, and distinguishes them sharply from *mysteries* that are outside that scope. The problems of consciousness and free will may well be mysteries, according to Chomsky. Be that as it may, Chomsky advocates the pursuit of fundamental questions – whether or not they turn out to be problems – with uniform scientific vigor without any pre- or post-scientific prejudice.

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Zoltán Gendler Szabó
The Sage School of Philosophy, Cornell University
E-mail: zs15@cornell.edu

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