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Noam Chomsky's Linguistic Theory

BY JAMES HIGGINBOTHAM

TWENTY-FIVE years have passed since the publication of Noam Chomsky's *Syntactic Structures*,¹ a slender volume that is widely conceded to have inaugurated a revolution in linguistics. The period has witnessed many trends and tides of thought, and Chomsky's own views have not stood still. In books and articles he has expounded and defended his ideas on matters of general scientific and philosophical interest no less than on particular questions of linguistic analysis. His most recent book, *Lectures on Government and Binding*,² is the broadest in scope of any of his writings on linguistics since the 1965 *Aspects of the Theory of Syntax*.³ The title essay of *Rules and Representations*,⁴ based upon lectures given at Columbia University in 1978 and at Stanford University in 1979, is Chomsky's latest statement of his general views, incorporating replies to critics (mostly philosophers) and taking note of developments in the field.

Despite changes in formulation, Chomsky's linguistic theory from *Syntactic Structures* to the present has maintained, in my opinion, a central core that constitutes the essentials of his position. It is my purpose in this essay to outline the theses that make up this core, and to consider some of the questions about them that have been, early and late, topics of concern in linguistics, philosophy, and psychology.

¹ Noam Chomsky, *Syntactic Structures* (The Hague: Mouton, 1957).

² Noam Chomsky, *Lectures on Government and Binding* (Dordrecht: Foris Publications, 1981).

³ Noam Chomsky, *Aspects of the Theory of Syntax* (Cambridge: MIT Press, 1965).

⁴ Noam Chomsky, *Rules and Regulations* (Oxford: Blackwell, 1980).

Language a Cognitive State

In Chomsky's view, language cannot profitably be understood as a system of habits, or conditioned responses, or dispositions to verbal behavior; it is more appropriately studied as a manifestation of a system of knowledge, specifically knowledge of grammar, that is put to use in speech and thought. The negative part of this thesis reflects Chomsky's criticisms of behaviorism; the positive part articulates the alternative conception of language with which his work is identified. But the criticism applies not only to a narrowly behavioral account of language, and Chomsky's notion of language as a product of knowledge of grammar sets the stage for linguistic research of a distinctive type.

Behaviorism, in any of its various forms, does not have the appeal that it once did. Psychologists are not so reluctant nowadays to posit interior, mental processes for the sake of explaining behavior, or changes in behavior, and to hypothesize mechanisms of learning that go beyond conditioning. The point is therefore perhaps worth emphasizing that linguistic theory, conceived as an account of knowledge of language, is not a liberated "science of behavior," freed from adventitious methodological scruples. If grammar is a system of knowledge, then a theory of grammar is a theory, not of language use, but of a cognitive state that is *available* for use. Grammar alone explains no behavior at all.

In *Aspects of the Theory of Syntax*, Chomsky called the state of a person who knows a language his *competence*, contrasting this with his verbal behavior and dispositions to verbal behavior, or *performance*. In retrospect Chomsky's terminology here seems to have been unfortunate. The term "competence" suggests that the possessor of competence possesses a skill of some sort; and "performance" correlatively suggests a domain of actual behavior that falls short in various respects of being ideally "competent." Both suggestions are misleading. The contrast between competence and performance is a contrast between

knowledge, on the one hand, and behavioral repertoire, on the other.

The first thesis, then, that I would identify as central to Chomsky's position over the years is that a theory of our linguistic nature may be sought whose first object of study is linguistic knowledge, not verbal behavior.

A recurrent theme, especially in philosophical discussion of Chomsky's work, has been skepticism over his use of cognitive notions in characterizing the object of study. A speaker of English, who is said in the normal way to "know English," obviously does not have knowledge of it in the sense of being able to state the rules and principles governing its grammar. In consequence, when Chomsky speaks of "knowledge of grammar," or further of "knowledge of the rules of grammar," many philosophers have been led to question whether the notion of knowledge is appropriate here. Noting in addition that knowledge of grammar does not amount to possession of a skill, hence not a case of "knowing how" to do something, these philosophers have often concluded that there is no appropriate sense of the term "knowledge" according to which linguistic theory can be a theory of the knowledge that native speakers have of their languages, or grammars.

To which it may be responded that these philosophical considerations merely show the impoverishment of the conceptions of knowledge that analytic philosophers have typically allowed in recent years. The conception is impoverished in that it makes no room for the types of description that linguistic theory provides for such an obviously cognitive state as "knowing English," and in that it does not allow for tacit, or implicit, or unconscious knowledge. In several places Chomsky has suggested that if the term "knowledge" gives offense, one may substitute a technical term, say "cognition," and speak of a person's "cognizing" his grammar rather than "knowing" it. In any event it will be cognizing that is the critical notion for linguistics.

The debate over whether there is, properly speaking, knowledge of grammar or of the rules of grammar is far from over: see Michael Dummett's review of *Rules and Representations* in the *London Review of Books*. The debate is not simply terminological, as we may see by switching to a more nearly neutral initial position. It is essential to Chomsky's research program that it be true or false to attribute grammars to persons as descriptions of their cognitive states. Simplifying only slightly, the assumption is that persons are in the states we commonly call "knowing English," or "knowing Chinese," etc. just when certain grammars G are to be attributed to them. To characterize linguistic competence is to solve for G . We may at this point leave open the question just what relation a person with grammar G stands in to G itself; but it must be true or false to say that he *has* G . The philosophical question is whether this relation is interpretable as a case of knowledge.

Although the question whether grammars are in some sense known is not insubstantial, it is not as significant for the practice of linguistics as the prior question whether attributions of grammars are a correct or fruitful way to describe cognitive states in the first place. The question of fruitfulness can certainly be answered in the affirmative; but it will be useful to describe the workings of grammars in more detail before contrasting Chomsky's approach with others that have been suggested.

I will follow customary usage in referring to the variety of linguistics that emerged chiefly in consequence of Chomsky's work as "generative grammar." What does a generative grammar of a language say about it, and how do generative grammars differ from traditional grammars? Quite apart from questions of methodology or metatheory, and specifically apart from Chomsky's own interpretation of his enterprise, there is an important respect in which generative grammar is an intellectual novelty: it is the first type of linguistic theory whose avowed aim is to make grammatical description *fully explicit*. There is justice in the observation that generative

grammar, particularly in syntax, represents first of all the application of formal methods made available in the twentieth century through logical and mathematical studies of formalized languages to empirically given, natural languages (Zellig Harris took this step as early as the 1940s). Only with these methods in hand are the problems of generative grammar formulable.

As an illustration, consider the notion “sentence of English.” An adequate generative grammar of English must in all cases, by purely formal means, correctly classify strings of English words as sentences or as nonsentences. Chomsky’s discussion in *Syntactic Structures* was devoted both to general and specific proposals for the construction of such a grammar.

It turns out that the construction of adequate generative grammars for natural language, even if considered only as a problem of technical interest, poses a serious intellectual challenge. Chomsky, appreciating the depth of the challenge early on, demonstrated that several initially plausible models for the form of grammar were not adequate to the task.

It is a fact, not only that writing a grammar for a language is a difficult (and so far unaccomplished) job, but also that it can be difficult to appreciate just how difficult the job actually is. The conditions of adequacy are so stringent that literally nothing can be omitted. From the point of view of generative grammar, therefore, it is a powerful blow to a theory of language that it cannot deliver explicit accounts at critical junctures. Inversely, since that point of view is not yet widely adopted, the force of the generative grammarian’s criticisms of other types of accounts of language is frequently blunted.

Chomsky is widely known for his critique of behaviorism, commencing with his 1959 review of B. F. Skinner’s *Verbal Behavior*. But I believe that, if we look a little beyond the proximate targets of Chomsky’s critical remarks on psychological practice and consider what Chomsky seems to take to be the central arguments in support of his criticisms, we shall find that the impact of these arguments has been marginal.

An essential criticism of Skinner is that the learning process as he describes it is at crucial points left to notions such as “analogy” and “generalization,” notions whose inexplicitness deprives them of explanatory power. That these notions still flourish is a measure of the novelty of the type of approach to language exemplified by generative grammar.

An aim of linguistic theory according to Chomsky, then, is—by constructing fully explicit, or generative, grammars that may be ascribed to persons—to understand in some measure in what linguistic competence consists. This research, however, still leaves to be filled in the nature of the relation between a person and the grammar to be ascribed to him.

A number of linguists and psychologists have suggested that, for a grammar correctly to be ascribed to a person, it should be in some sense *directly used* by the person in the course of verbal behavior. The pertinent notion of “direct use” is not easy to formulate, and in any case varies from proposal to proposal. On one interpretation, a grammar would be directly used to the extent that its rules and the descriptions of sentences that it provides correspond in some experimentally determinate ways to properties of mental activity—for instance, whatever activity is involved in the perception and production of speech.

The thesis that grammars are correctly ascribed only to the degree that they can be directly implicated in verbal behavior is often expressed as the view that grammars should be “psychologically real.”⁵ We can see this view as prompted by the desire to pin down an appropriate sense in which grammars are to be ascribed to persons.

On the question of “psychological reality,” as on the question whether grammars ascribe knowledge, Chomsky’s view has consistently been that no grounds for skepticism about the objectivity or cogency of the linguistic enterprise, or charac-

⁵ See for instance the discussion in J. A. Fodor, T. G. Bever, and M. F. Garrett, *The Psychology of Language* (New York: McGraw-Hill, 1974).

terizing a normal speaker's grasp of his language in terms of a generative grammar, have been educed; see the later essays in *Rules and Representations*. I am inclined to think that Chomsky is right about this matter, but there is no space to argue the issue here. In any event, Chomsky's thesis that grammar should be viewed as an enterprise descriptive not of behavior but of a capacity manifested in behavior is only the first of those that sustain linguistic research as he conceives it. We turn now to some other aspects of his program.

Mentalism vs. Physicalism

The descriptions provided by the ascription of grammars to persons are, we have seen, to be abstract descriptions of cognitive states of those persons. Now, these cognitive states doubtless admit of physical descriptions as well, and surely must be counted as having the cognitive powers that they do in virtue of their physical organization. I say "surely," thereby acquiescing in physicalism, a position that is now as formerly subject to interpretation, doubt, and controversy. Supposing, however, that physicalism is in some sense true, we can bring out a distinctive feature of Chomsky's type of inquiry, a feature that is borne also by Freud's accounts of mental life. This feature is the thesis that the theory of mind can fruitfully proceed in the absence of all but the most tenuous connections between its type of descriptions of cognitive states and their physical embodiments. Chomsky's theory is thus mentalistic in a double sense, abstracting both from the direct explanation of behavior and from the physical underpinnings of the states that it is the theory's aim to describe.

It is interesting to contrast Chomsky's advocacy of mentalistic linguistics with a view that has been worked out in some systematic detail, namely that of W. V. Quine as expressed in several of his writings over the years. Quine's view, as I understand it, is that explanation of the growth of human knowl-

edge, and of knowledge of language in particular, can be expected to make progress along the course of first conjecturing, and then trying to understand in physical detail, the mechanisms responsible for dispositions to behavior and for changes in dispositions.⁶ The research program thus envisaged has no place for abstract accounts of linguistic competence, because these are accounts neither of dispositions to behavior nor of possible physical mechanisms.

Mentalistic accounts of language may be viewed with suspicion from several points of view less severe than that of Quine. But it should be noted that the wholesale rejection of mentalism also carries risks, perhaps the greatest of which is that of ignoring whole domains of reasonable inquiry, because they do not yield at once to methods of investigation that are not mentalistic. A good case can be made that the structure of human language is one domain that received less than adequate investigation in part because the problems there posed can, at present, only be put in mentalistic terms. Chomsky's work has been the first and primary instrument in opening up this domain.

Language Acquisition as Theory-Construction

Thus far I have identified two theses that have, I believe, guided Chomsky's work in linguistics since its inception. The third thesis that I will discuss here was first stated explicitly by Chomsky in *Aspects of the Theory of Syntax*: that the acquisition of language might be studied as a kind of theory-construction, in which the child, on the basis of his linguistic experience, comes to deduce the nature of the grammar of the language to which he is exposed. Let us consider this thesis in somewhat more detail.

⁶ See particularly Quine's essay, "Mind and Verbal Dispositions," in Samuel D. Guttenplan, ed., *Mind and Language* (Oxford: Clarendon Press, 1975).

If grammar is viewed as the outcome of linguistic experience, the experience serving to convert the state of the child from ignorance to knowledge of language, then there is an initial state on which this experience acts in some determinate way. The initial state Chomsky calls *universal grammar*. Universal grammar represents the contribution of the child to the cognitive state attained on the basis of experience; it is, by definition, innate, and must include information about both what grammars are possible for human languages and how grammars from among the possible ones are to be selected. Chomsky's program of research, fully realized, would characterize both the grammars of human languages and the selection to be ascribed to universal grammar.

Within linguistics itself, what now principally distinguishes Chomsky's position and type of research is the thesis just outlined, that the fundamental aim of linguistic theory is to explain (insofar as explanation is possible with the tools available, and within the limits of the degree of abstraction presently required) the acquisition of language by normal human beings. From this perspective, the description of features of language is never an end in itself; rather, it is at best preliminary to the task of deducing those features from the structure ascribed to universal grammar, under the conditions of exposure to language that children typically undergo.

The term "universal grammar" misleadingly suggests that the study of universal grammar would intimately, or perhaps exclusively, involve taking a principled inventory of those features that grammars of human languages have in common. It may therefore be worth stressing that, understood in Chomsky's sense, universal grammar is nothing else but the initial state of the human language-learner. This initial state may well involve factors that determine universal features of language, but may also, and even principally, consist in principles that select among forms of grammars that are very different from each other. To put the point another way, the cogency of Chomsky's program is not undermined by obser-

vations on the diversity of human languages; and the problem in any case is to account for how the child *does* come to acquire the grammar of the language to which he is exposed.

The research program, by parity of reasoning, can be extended to other domains than language; in several places Chomsky has suggested so extending it. The picture that he sometimes presents is that of the mind as composed of several "mental organs," including language, knowledge of the behavior of ordinary physical bodies, knowledge of human beings, and so forth, each of which matures under the conditions given by normal experience on the basis of an initial state, which might be studied as leading to the knowledge in question on the basis of its specific construction. This thesis is best viewed as additional to the thesis that the acquisition of language may be studied in the way Chomsky's linguistic theory aims for. The reason is that the formulation of the inquiry into language leaves open the question whether our cognitive capacities for language are specific to the task at hand, or rather represent a specialization of some more general learning apparatus. Chomsky's own position is that, so far as we are now able to judge, the capacity to acquire language should be counted as a separable faculty of the mind—one among perhaps many "mental organs." An alternative view, which seems to be supported by the Piagetians among others, is that knowledge of language is the result of applying generalized learning strategies to linguistic material, strategies that, applied to other domains, would yield knowledge of other sorts.

Abstracting from the question of the specificity of the language faculty, we may note that there is a sense in which the third step that Chomsky takes, of formulating a program for research on language acquisition, is riskier than the step of investigating language in comparative isolation from its physical embodiment and connections with behavior. The reason is simple: the study of grammar conceived in the generativist

way, as aiming for a fully explicit account where traditional grammar gave only incomplete sketches, is valuable for our understanding of the nature of language independently of what may turn out with respect to its physical realization or behavioral correlates (indeed, we can make a strong case that it is indispensable for understanding the latter); but the acquisition problem is one that might *fail* of tractability within the limits of grammatical theory alone.

Progress in the acquisition problem can proceed only correlative with a deeper understanding of what is in fact acquired—that is, in Chomsky's terms, what the nature of linguistic competence is. Commencing with *Syntactic Structures* and the longer work on which it was based, Chomsky has argued that the simplest models of linguistic competence will incorporate formal devices of powerful sorts, not in general available within traditional linguistics. A technical feature of the generative grammars of the type Chomsky has advocated is their use of certain formal operations called *grammatical transformations*, whose role it is to relate levels of description of linguistic structure to one another. In the scheme of *Aspects of the Theory of Syntax*, transformations mediated between two levels called *deep structure* and *surface structure*, representations at these levels fulfilling different functions within the system as a whole. Some version of transformations, and of the distinction between deep and surface structure, persists not only in Chomsky's recent work, but also in work within other frameworks. The use of such devices has proved indispensable to the project of giving a clear and explicit presentation of linguistic structure.

It is to be stressed, however, that the program of explaining language acquisition by internal means within the theory of grammar is not one that is tied to transformations, deep and surface structure, or any other specific technical device. Inversely, technical devices can be employed for the purpose of giving perspicuous linguistic descriptions quite independently

of the further question how such descriptions may be brought to bear on the problem of acquisition, the distinctive problem that Chomsky's type of research sets.

I have said that Chomsky's research is to be distinguished by the degree to which it subordinates problems of linguistic description to the overarching aim of explaining acquisition. How much progress has been made on the latter? The recent *Lectures on Government and Binding* is an attempt to study the question of acquisition more closely, by formulating a theory of comparative syntax—that is, a theory of the ways languages may and do differ in their syntactic organization.

Given the psychological orientation of Chomsky's theory, comparative syntax for him becomes primarily the study of how the child, on the basis of the linguistic information available to him, distinguishes the syntax of the language to which he is exposed from other admissible systems. A good theory in this domain, Chomsky argues, should have the property that a few detectable features of a language should suffice to fix the form and functioning of a host of grammatical rules. A simple image may help to convey how such a theory might work. Imagine that a grammar is selected (apart from the meanings of individual words) by setting a small number of switches—20, say—either “On” or “Off.” Linguistic information available to the child determines how these switches are to be set. In that case, a huge number of different grammars (here, 2 to the twentieth power) will be prelinguistically available, although a small amount of experience may suffice to fix one.

The switch-settings of the metaphor above are in Chomsky's terminology the “parameters” defined by universal grammar. Notice that this image underscores the sense in which universal grammar, the initial state of the language-learner, need not comprise an account of what languages have in common—to continue the metaphor, different switch-settings could give rise to very different grammatical systems.

If one views comparative syntax from this perspective, then

grammatical analyses that might be formulated for, say, English ought to have the property that they mesh with analyses of similar or interestingly different phenomena in other languages. For a concrete example, consider that in English, corresponding to the sentence (1), there are two forms of direct question, namely (2) and (3):

- (1) You bought the book for John.
- (2) Who did you buy the book for?
- (3) For whom did you buy the book?

In French, however, only the form corresponding to (3) is permitted (in other words, the form “*Qui avez-vous acheté le livre pour?*” is ungrammatical). Any analysis, therefore, that makes both (2) and (3) routinely available to the learner of English is likely to be wrong, because it would not contribute to the explanation of why only one of these forms exists in French. With respect to these forms, in fact, it appears that French is the norm among languages, and English the exception. The problem, then, is to explain why English should admit forms like (2). This is not the place to discuss solutions that have been proposed—what is to be noted is that the status of (2) as a *problem* is directly dependent upon the incorporation of the analytical task of linguistic description within a broader program of the explanation of language acquisition.

The broader program has arguably made some progress, motivated by the analysis of examples like those above. Whether that program will make progress in its own terms, or indeed whether those terms will not in time be transformed out of all present recognition, remains to be seen.

Chomsky's Influence

I have outlined three theses that I would attribute to Chomsky as characterizing his work during the last quarter-century: that language is in the first instance most profitably pursued as a cognitive state rather than a type of behavior;

that the study of this state may proceed in abstraction from the knowledge of the physical organization ultimately responsible for it; and that the question of how human beings acquire their native languages under the conditions of acquisition that we observe may be pursued internally within the theory of grammar. These theses I have given in what seems to me a natural order of increasing strength: skepticism about earlier ones will extend to later, though not conversely.

Chomsky's influence on linguistics has been very great. But in assessing the significance of his work, it is as important to show the points where it has failed to have much impact as it is to note the places where the intellectual climate has changed through the influence of his arguments. In several places in this essay I have remarked points where Chomsky's theses have met with skepticism or have failed to arouse a significant response. In conclusion I will speculate as to why this skepticism or *de facto* indifference obtains, not for the purpose of charging that Chomsky is right and the critics wrong, or *vice versa*, but rather for the sake of understanding the sources of the skepticism. They include, I think, at least these two: Chomsky's conception of linguistics places the study of language in an area remote from traditional, humanistic concerns; and his method of inquiry, particularly in its abstraction from behavior and from physical structures and mechanisms, seems to be opposed to some views of what ought to count as respectable science.

Documents critical of Chomsky's linguistic theory, both in its details and in its general outlook, that draw arguments from the two sources just mentioned are legion; I will not give explicit references here.

For the first point, there seems to be a tendency to view language, an object that arises only *within* culture, and may be said to have had a long and significant history, as a thing that must therefore be understood only *from* a cultural or historical perspective. The unwarranted belief, still common among educated persons, that human language evolved from primi-

tive beginnings, and that primitive peoples speak more primitively than we, is perhaps a reflex of this general equation of language with culture. The growth of language seems, on this view, properly analogous to the growth of civilization, and not, as in Chomsky's metaphor of mental organs, analogous to the growth of liver. This attitude toward language, I think, can make Chomsky's views seem bizarre.

The second point, whether Chomsky's research program is respectably scientific, is much debated, particularly by philosophers. I have remarked on some features of this debate above: the question whether linguistic competence is knowledge, whether cognitive states can be identified and studied in comparative isolation from their physical underpinnings and behavioral correlates, and others. Remarkably, there has been little discussion of the details of grammatical theory itself; most of the critical remarks have been external to it, rather than from within. Not that philosophers, not experts in the sciences, should refrain from trying to formulate general criteria for the evaluation of scientific achievement and understanding. We all speculate about the sciences anyway, and the hope is that philosophers will do it more clearly than most. But I am inclined to think that, until Chomsky's theory is more critically examined in its own terms, what it may have to teach us, through its successes *and* its failures, will not have been taken up within the broader context of our effort to obtain a better understanding of human knowledge, thought, and discourse.