Language and Mind

This is the long-awaited third edition of Chomsky's outstanding collection of essays on language and mind. The first six chapters, originally published in the 1960s, made a groundbreaking contribution to linguistic theory. This new edition complements them with an additional chapter and a new preface, bringing Chomsky's influential approach into the twenty-first century. Chapters 1–6 present Chomsky's early work on the nature and acquisition of language as a genetically endowed, biological system (Universal Grammar), through the rules and principles of which we acquire an internalized knowledge (I-language). Over the past fifty years, this framework has sparked an explosion of inquiry into a wide range of languages, and has yielded some major theoretical questions. The final chapter revisits the key issues, reviewing the "biolinguistic" approach that has guided Chomsky's work from its origins to the present day, and raising some novel and exciting challenges for the study of language and mind.

NOAM CHOMSKY is Professor of Linguistics at Massachusetts Institute of Technology. His many books include *New Horizons in the Study of Language and Mind* (Cambridge University Press, 2000) and *On Nature and Language* (Cambridge University Press, 2002).

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Third Edition

Noam Chomsky

Massachusetts Institute of Technology

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Contents

Preface to the third edition

The first six chapters that follow are from the late 1960s, mostly based on talks for general university audiences, hence relatively informal. The final chapter is from 2004, based on a talk for a general audience. This recent essay reviews the "biolinguistic approach" that has guided this work from its origins half a century ago, some of the important developments of recent decades, and how the general approach looks today – to me at least.

The dominant approach to questions of language and mind in the 1950s was that of the behavioral sciences. As the term indicates, the object of inquiry was taken to be behavior, or, for linguistics, the products of behavior: perhaps a corpus obtained from informants by the elicitation techniques taught in field methods courses. Linguistic theory consisted of procedures of analysis, primarily segmentation and classification, designed to organize a body of linguistic material, guided by limited assumptions about structural properties and their arrangement. The prominent linguist Martin Joos hardly exaggerated in a 1955 exposition when he identified the "decisive direction" of contemporary structural linguistics as the decision that language can be "described without any preexistent scheme of what a language must be."[1] Prevailing approaches in the behavioral sciences generally were not very different. Of course, no one accepted the incoherent notion of a "blank slate." But it was common to suppose that beyond some initial delimitation of properties detected in the environment (a "quality space," in the framework of the highly influential philosopher W. V. O. Quine), general learning mechanisms of some kind should suffice to account for what organisms, including humans, know and do. Genetic endowment in these domains would not be expected to reach much beyond something like that.

The emerging biolinguistic approach adopted a different stance. It took the object of inquiry to be, not behavior and its products, but the internal cognitive

[1] Chapter 3, note 12. Joos was referring explicitly to the "Boasian tradition" of American structuralism, and had only a few – rather disparaging – remarks about European structuralism. But the observations carry over without too much change.

systems that enter into action and interpretation, and, beyond that, the basis in our fixed biological nature for the growth and development of these internal systems. From this point of view, the central topic of concern is what Juan Huarte, in the sixteenth century, regarded as the essential property of human intelligence: the capacity of the human mind to "engender within itself, by its own power, the principles on which knowledge rests,"[2] ideas that were developed in important ways in the philosophical–scientific traditions of later years. For language, "the principles on which knowledge rests" are those of the internalized language (*I-language*) that the person has acquired. Having acquired these principles, Jones has a wide range of knowledge, for example that *glink* but not *glnik* is a possible lexical item of English; that *John is too angry to talk to (Mary)* means that John is to be talked to (if *Mary* is missing) but John is to do the talking (if *Mary* is present); that *him* can be used to refer to John in the sentence *I wonder who John expects to see him*, but not if *I wonder who* is omitted; that if John painted the house brown then he put the paint on the exterior surface though he could paint the house brown on the inside; that when John climbed the mountain he went up although he can climb down the mountain; that books are in some sense simultaneously abstract and concrete as in *John memorized and then burned the book*; and so on over an unbounded range. "The power to engender" the I-language principles on which such particular cases of knowledge rest is understood to be the component of the genetic endowment that accounts for their growth and development.

Linguistics, so conceived, seeks to discover true theories of particular I-languages (*grammars*), and, at a deeper level, the theory of the genetic basis for language acquisition (*universal grammar*, *UG*, adapting a traditional term to a new usage). Other cognitive systems, it was assumed, should be conceived along similar lines, each with its own principles, and powers of engendering them.

Within this framework, cognitive systems are understood to be, in effect, organs of the body, primarily the brain, to be investigated in much the manner of other subcomponents with distinctive properties that interact in the life of the organism: the systems of vision, motor planning, circulation of the blood, etc. Along with their role in behavior, the "cognitive organs" enter into activities traditionally regarded as mental: thought, planning, interpretation, evaluation, and so on. The term "mental" here is informal and descriptive, pretty much on a par with such loose descriptive terms as "chemical," "electrical," "optical," and others that are used to focus attention on particular aspects of the world that seem to have an integrated character and to be worth abstracting for special investigation, but without any illusion that they carve nature at the joints. Behavior and its products – such as texts – provide data that may be useful as

[2] Chapter 1, pp. 8–9.

evidence to determine the nature and origins of cognitive systems, but have no privileged status for such inquiries, just as in the case of other organs of the body.

The general shift of perspective is sometimes called the "cognitive revolution" of the 1950s. However, for reasons discussed in the early essays that follow, I think it might more properly be considered a renewal and further development of the cognitive revolution of the seventeenth century. From the 1950s, many traditional questions were revived – regrettably, without acquaintance with the tradition, which had been largely forgotten or misrepresented. Also revived was the view that had been crystallizing through the eighteenth century that properties "termed mental" are the result of "such an organical structure as that of the brain" (chemist–philosopher Joseph Priestley). This development of "Locke's suggestion," as it is called in the scholarly literature, was a natural, virtually inevitable, concomitant of the Newtonian revolution, which effectively dismantled the only significant notion of "body" or "physical." The basic conclusion was well understood by the nineteenth-century. Darwin asked rhetorically why "thought, being a secretion of the brain," should be considered "more wonderful than gravity, a property of matter." In his classic nineteenth-century history of materialism, Friedrich Lange observes that scientists have "accustomed ourselves to the abstract notion of forces, or rather to a notion hovering in a mystic obscurity between abstraction and concrete comprehension," a "turning-point" in the history of materialism that removes the surviving remnants of the doctrine far from the ideas and concerns of the "genuine Materialists" of the seventeenth century, and deprives them of significance. They need be of no special concern in the study of aspects of the world "termed mental."

It is perhaps worth noting that this traditional understanding is still regarded as highly contentious, and repetition of it, almost in virtually the same words, is regularly proposed as a "bold hypothesis" or "radical new idea" in the study of the domains "termed mental."[3]

Another significant feature of the original cognitive revolution was the recognition that properties of the world termed mental may involve unbounded capacities of a limited finite organ, the "infinite use of finite means," in Wilhelm von Humboldt's phrase. The doctrine was at the heart of the Cartesian concept of mind. It provided the basic criterion to deal with the problem of "other minds" – to determine whether some creature has a mind like ours. Descartes and his followers focused on use of language as the clearest illustration. In a rather similar vein, Hume later recognized that our moral judgments are unbounded in scope, and must be founded on general principles that are part of our nature – genetically determined, in modern terms. That observation poses

[3] For examples and discussion, see my *New Horizons in the Study of Language and Mind* (Cambridge, 2000).

Huarte's problem in a different domain, and is, by now, the topic of intriguing empirical research and conceptual analysis.

By the mid twentieth century, it had become possible to face such problems as these in a more substantive way than in earlier periods. There was, by then, a clear general understanding of finite generative systems with unbounded scope, which could be readily adapted to the reframing and investigation of traditional questions that had necessarily been left obscure. Another influential factor in the renewal of the cognitive revolution was the work of ethologists and comparative psychologists, then just coming to be more readily accessible, with its concern for "the innate working hypotheses present in subhuman organisms," and the "human a priori," which should have much the same character.[4] That framework too could be adapted to the study of human cognitive organs and their genetically determined nature, which constructs experience – the organism's *Umwelt*, in ethological terminology – and guides the general path of development, just as in all other aspects of growth of organisms.

Meanwhile, efforts to sharpen and refine procedural approaches ran into serious difficulties, revealing what appear to be intrinsic inadequacies. A basic problem is that even the most simple elements of discourse are not detectable by procedures of segmentation and classification. They do not have the required "beads on a string" property for such procedures to operate, and often cannot be located in some identifiable part of the physical event that corresponds to the mind-internal expression in which these elements function. It became increasingly clear that even the simplest units – morphemes, elementary lexical items, for that matter even phonological segments – can be identified only by their role in generative procedures that form linguistic expressions. These expressions, in turn, can be regarded as "instructions" to other systems of the mind/body that are used for mental operations, as well as for production of utterances and interpretation of external signals. More generally, study of the postulated mechanisms of learning and control of behavior in the behavioral sciences revealed fundamental inadequacies, and even at the core of the disciplines serious doubts were arising as to whether the entire enterprise was viable, apart from its utility for design of experiments that might be useful for some other purpose.

For the study of language, a natural conclusion seemed to be that the I-language attained has roughly the character of a scientific theory: an integrated system of rules and principles from which the expressions of the language can be derived, each of them a collection of instructions for thought and action. The child must somehow select the I-language from the flux of experience. The problem appeared to be similar to what Charles Sanders Peirce had called *abduction*, in considering the problem of scientific discovery.[5] And as in the

[4] Konrad Lorenz; chapter 3, pp. 83–84, below.
[5] See chapter 3, pp. 79–81, below.

case of the sciences, the task is impossible without what Peirce called a "limit on admissible hypotheses" that permits only certain theories to be entertained, but not infinitely many others compatible with relevant data. In the language case, it appeared that the genetic endowment of the language faculty must impose a format for rule systems that is sufficiently restrictive so that candidate I-languages are "scattered," and only a small number can even be considered in the course of language acquisition. In later work in the cognitive sciences, such approaches are often called "theory theory" conceptions.[6] Like abduction, and for that matter every aspect of growth and development, language acquisition faces a problem of *poverty of stimulus*. The general observation is transparent, so much so that outside of the cognitive sciences the ubiquitous phenomenon is not even dignified with a name: no one speaks of the problem of poverty of stimulus for an embryo that has somehow to become a worm or a cat, given the nutritional environment, or in any aspect of post-natal development, say undergoing puberty.

In the essays reprinted below from the 1960s, the nature and acquisition of language presented and discussed adopts the general framework just outlined. "The most challenging theoretical problem in linguistics" was therefore taken to be "that of discovering the principles of universal grammar," which "determine the choice of hypotheses" – that is, restrict the accessible I-languages. It was also recognized, however, that for language, as for other biological organisms, a still more challenging problem lies on the horizon: to discover "the laws that determine possible successful mutation and the nature of complex organisms," quite apart from the particular cognitive organs or other organic systems under investigation.[7] As the same point was made a few years earlier: "there is surely no reason today for taking seriously a position that attributes a complex human achievement entirely to months (or at most years) of experience [as in the behavioral sciences], rather than to millions of years of evolution [as in the study of the specific biological endowment, UG in the language case], or to principles of neural organization that may be more deeply grounded in physical law"[8] – a "third factor" in growth and development, organ- and possibly organism-independent. Investigation of the third factor seemed too remote from inquiry to merit much attention, and was therefore barely mentioned, though, in fact, even some of the earliest work – for example, on elimination of redundancy in rule systems – was implicitly guided by such concerns.

In the years that followed, the topics under investigation were substantially extended, not only in language-related areas but in the cognitive sciences generally. By the early 1980s, a substantial shift of perspective within linguistics

[6] Advocates of these approaches disagree, but mistakenly, I believe. See L. Antony and N. Hornstein, *Chomsky and his Critics* (Blackwell, 2003), chapter 10, and reply.
[7] Pp. 47, 85f., below.
[8] Chomsky, *Aspects of the Theory of Syntax* (Cambridge, Mass: MIT Press, 1965), p. 59.

reframed the basic questions considerably, abandoning entirely the format conception of linguistic theory in favor of an approach that sought to limit attainable I-languages to a finite set, aside from lexical choices (these too highly restricted). This *Principles and Parameters* approach may or may not turn out to be justified; one can never know. But as a research program, it has been highly successful, yielding an explosion of empirical inquiry into a very wide range of typologically varied languages, posing new theoretical questions that could scarcely have been formulated before, often providing at least partial answers as well, while also revitalizing related areas of language acquisition and processing. Another consequence is that it removed some basic conceptual barriers to the serious inquiry into the deeper "third factor" issues. These topics are reviewed in the lecture that closes this collection. They raise possibilities that, in my personal view at least, suggest novel and exciting challenges for the study of language in particular and problems of mind more generally.

Preface to the second edition

The six chapters that follow fall into two groups. The first three constitute the monograph *Language and Mind*, published in 1968. As the preface to *Language and Mind*, reprinted below, explains, the three essays on linguistic contributions to the study of mind (past, present, and future) are based on the Beckman lectures, delivered before a university-wide audience at the University of California, Berkeley, in January 1967. These essays constitute a unit distinct from the three chapters that follow them.

Chapter 4, "Form and meaning in natural languages," is the approximate text of a rather informal lecture given in January 1969 at Gustavus Adolphus College in Minnesota to an audience consisting largely of high school and college students and teachers. It reviews some of the basic notions presented in *Language and Mind* and other works, and in addition presents some later work on semantic interpretation of syntactic structures. This material, I believe, reveals some of the limitations and inadequacies of earlier theory and suggests a direction in which this theory should be revised. More technical investigations of this and related matters appear in forthcoming monographs of mine, *Semantics in Generative Grammar* and *Conditions on Rules*, to be published by Mouton and Co., The Hague, in 1972.

Chapter 5 is a considerably more technical study, exploring in some detail material that is presupposed or only informally developed in *Language and Mind.* The intended audience in this case consisted primarily of psychologists and psycholinguists. This chapter, which originally appeared as an appendix to Eric Lenneberg's *Biological Foundations of Language*, is an attempt to give a concise and systematic presentation of the theory of transformational-generative grammar and to explore its potential significance for human psychology. The monographs just cited carry the technical investigations further, in part, in directions that are briefly indicated in this chapter, which was actually written in 1965 and is therefore the earliest of the essays collected here.

Chapter 6 was directed to a rather different audience, namely, professional philosophers. This was a contribution to a symposium on linguistics and philosophy held at New York University in April 1968. The purpose of this lecture was to explore the points of contact between contemporary linguistics and

philosophy – in particular, epistemology and philosophy of mind. The suggestion has been made that current work in linguistics has interesting insights to offer into the nature of human knowledge, the basis for its acquisition, and the ways it characteristically is used. In part, this essay is concerned with the debate that has arisen over these issues; in part, with the issues themselves.

There is a certain degree of redundancy in these essays. Chapters 4, 5, and 6 are each more or less self-contained. Each presupposes very little, and therefore some of the expository sections overlap, and overlap further with the chapters that constitute *Language and Mind.* I hope that the somewhat varying formulations of basic points may prove helpful. In fact, even the simplest and most basic points discussed in these essays have been widely misconstrued. For example, there has been a tendency in popular discussion to confuse "deep structure" with "generative grammar" or with "universal grammar." And a number of professional linguists have repeatedly confused what I refer to here as "the creative aspect of language use" with the recursive property of generative grammars, a very different matter. In the hope that such questions as these will be clarified, I have not eliminated redundancies in collecting these essays.

Chapters 4–6 extend and enlarge upon the ideas and material discussed in the Beckman lectures. All of these essays are concerned primarily with the area of intersection of linguistics, philosophy, and psychology. Their primary purpose is to show how the rather technical study of language structure can contribute to an understanding of human intelligence. I believe, and try to show in these essays, that the study of language structure reveals properties of mind that underlie the exercise of human mental capacities in normal activities, such as the use of language in the ordinary free and creative fashion.

At the cost of a final redundancy, I would like to underscore here the observations in the preface to *Language and Mind* concerning the so-called "behavioral sciences." Currently there is a good deal of discussion – and not infrequently, rather extravagant claims – concerning the implications of the behavioral sciences for human affairs. It is important to bear in mind that there are few nontrivial empirical hypotheses relating to the question of how humans behave and why they act as they do under ordinary circumstances. The reader who undertakes the useful exercise of searching the literature will discover, I believe, not only that there is little significant scientific knowledge in this domain, but further that the behavioral sciences have commonly insisted upon certain arbitrary methodological restrictions that make it virtually impossible for scientific knowledge of a nontrivial character to be attained.

We can begin to see how human knowledge and systems of belief might be acquired, in certain areas. The case of language is particularly interesting because language plays an essential role in thinking and human interaction, and because in this case we can begin to describe the system of knowledge that is attained and to formulate some plausible hypotheses about the intrinsic

human capacities that make this achievement possible. These glimmerings of understanding are interesting in themselves and suggestive as well for other studies. We can be reasonably certain that the investigation of direct relations between experience and action, between stimuli and responses, will in general be a vain pursuit. In all but the most elementary cases, what a person does depends in large measure on what he knows, believes, and anticipates. A study of human behavior that is not based on at least a tentative formulation of relevant systems of knowledge and belief is predestined to triviality and irrelevance. The study of human learning can begin, in a serious way, only when such a tentative formulation of systems of knowledge and belief is presented. We can then ask by what means these systems are acquired, given the data of experience. Similarly, the study of human behavior can hardly be undertaken in a serious way unless we are in a position to ask how what a person does is related to what he knows, believes, and expects. Only when we have formulated some tentative hypotheses as to what is learned can we undertake a serious study of human learning; only when we have formulated some tentative hypotheses as to what has been learned – what is known and believed – can we turn in a serious way to the investigation of behavior. In the case of language, we can present some tentative but rather detailed and complex formulations of what is known, what has been learned by the normal speaker-hearer. For this reason, the study of language seems to me of particular interest for the study of human learning and behavior.

But it must be emphasized that language may be a rather special case. Knowledge of language is normally attained through brief exposure, and the character of the acquired knowledge may be largely predetermined. One would expect that human language should directly reflect the characteristics of human intellectual capacities, that language should be a direct "mirror of mind" in ways in which other systems of knowledge and belief cannot. Furthermore, even if we were able to account for the acquisition of language along the lines discussed in these essays, we would still be left with the problem of accounting for the normal use of the acquired knowledge. But this problem is, at the moment, quite intractable. It lies beyond the scope of scientific inquiry. Of course, it would be entirely irrational to argue that certain phenomena and certain problems do not exist, merely because they lie beyond the scope of scientific inquiry – at present, and perhaps intrinsically because of the scope of human intelligence, which after all is itself structured and bounded in ways that are unknown in any detail. Given the primitive character of the study of man and society and its general lack of intellectual substance, we can only speculate about the essential and basic factors that enter into human behavior, and it would be quite irresponsible to claim otherwise. Speculation about these matters is quite legitimate, even essential. It should be guided, where this is possible, by such limited and fragmentary knowledge as exists. But speculation should be clearly labeled

as such and clearly distinguished from the achievements of scientific inquiry. This is a matter of considerable importance in a society that tends to trust in professional expertise and to rely on professional judgments. The scientist, in particular, has a responsibility to the public in this regard.

Massachusetts Institute of Technology N. C.

Preface to the first edition

The three chapters of this book are somewhat elaborated versions of three lectures, the Beckman lectures, that I delivered at the University of California, at Berkeley, in January 1967. The first is an attempt to evaluate past contributions to the study of mind that have been based on research and speculation regarding the nature of language. The second is devoted to contemporary developments in linguistics that have a bearing on the study of mind. The third is a highly speculative discussion of directions that the study of language and mind might take in coming years. The three lectures, then, are concerned with the past, the present, and the future.

Given the state of research into the history of linguistics, even the attempt to evaluate past contributions must be regarded as highly tentative. Modern linguistics shares the delusion – the accurate term, I believe – that the modern "behavioral sciences" have in some essential respect achieved a transition from "speculation" to "science" and that earlier work can be safely consigned to the antiquarians. Obviously any rational person will favor rigorous analysis and careful experiment; but to a considerable degree, I feel, the "behavioral sciences" are merely mimicking the surface features of the natural sciences; much of their scientific character has been achieved by a restriction of subject matter and a concentration on rather peripheral issues. Such narrowing of focus can be justified if it leads to achievements of real intellectual significance, but in this case, I think it would be very difficult to show that the narrowing of scope has led to deep and significant results. Furthermore, there has been a natural but unfortunate tendency to "extrapolate," from the thimbleful of knowledge that has been attained in careful experimental work and rigorous data-processing, to issues of much wider significance and of great social concern. This is a serious matter. The experts have the responsibility of making clear the actual limits of their understanding and of the results they have so far achieved, and a careful analysis of these limits will demonstrate, I believe, that in virtually every domain of the social and behavioral sciences the results achieved to date will not support such "extrapolation." Such analysis will also show, I believe, that the contributions of earlier thought and speculation cannot be safely neglected, that in large measure they provide an indispensable basis for serious work today.

I do not attempt here to justify this point of view in general, but merely assert that it is the point of view underlying the lectures that follow.

In the second lecture I have made no attempt to give a systematic presentation of what has been achieved in linguistic research; rather, I have concentrated on problems that are at the borderline of research and that still resist solution. Much of the material in this lecture is to appear in a chapter entitled "Problems of Explanation in Linguistics" in *Explanations in Psychology*, edited by R. Borger and F. Cioffi (New York: Cambridge University Press, 1967), along with interesting critical comments by Max Black. Lectures 1 and 3 make use of some material from a lecture delivered at the University of Chicago in April 1966 that appears in *Changing Perspectives on Man*, edited by B. Rothblatt (Chicago: University of Chicago Press, 1968). A portion of the first lecture was published in the *Columbia University Forum*, Spring 1968 (Vol. XI, No. 1), and a portion of the third lecture will appear in the Fall 1968 issue (Vol. XI, No. 3).

I would like to express my thanks to members of the faculty and the student body at Berkeley for many useful comments and reactions and, more generally, for the rich and stimulating intellectual climate in which I was privileged to spend several months just prior to these lectures. I am also indebted to John Ross and Morris Halle for helpful comments and suggestions.