Introduction

A Child of the Enlightenment. (Chomsky, 1992b: 158)

Chomsky's achievement

Why is Chomsky important? He has shown that the immense complexity of the innumerable languages we hear around us must be variations on a single theme, Universal Grammar.[1] He has revolutionized linguistics, and in so doing has set a cat among the philosophical pigeons. He has resurrected the theory of innate ideas, demonstrating that a substantial part of our knowledge is genetically determined, reinstating in a new way rationalist ideas that go back centuries, but which had fallen into disrepute; and he has provided evidence that "unconscious knowledge"[2] is what underlies our ability to speak and understand. He has played a major role in overturning the dominant school of behaviorism in psychology, and has returned the mind to its position of pre-eminence in the study of humankind. In short, Chomsky has changed the way we think of ourselves, gaining a position in the history of ideas on a par with that of Darwin or Descartes. And he has done this while devoting the majority of his time to dissident politics and activism: documenting the lies of government, exposing the hidden influences of big business, developing a model of the social order, and acting as the conscience of the West.[3]

In recent history his peers in influence are such disparate figures as Einstein, Picasso, and Freud, with each of whom he has something in common. Like Freud – but with added intellectual rigor – he has changed our conception of the mind; like Einstein, he blends intense scientific creativity with radical political activism; like Picasso, he has overturned and replaced his own established systems with startling frequency. The most recent example of this iconoclasm – his "Minimalist Program" – calls into question a considerable proportion of his earlier achievement documenting the richness of the innate basis of the language faculty, with the aim of putting it on a sounder footing. Perhaps his greatest similarity is to Bertrand Russell, whose early work, *Principia Mathematica*, redefined the foundations of mathematics, and who devoted much of his life to political

1

writing and activism. But while everyone knows something about mathematics, that most people have even heard of linguistics is largely due to Chomsky. His renown in linguistics, philosophy, and psychology first ensured that a few people would listen to his political views; subsequently, his political fame, or notoriety, has attracted attention to his academic work, which has brought the study of language into the mainstream of scientific research, and simultaneously made it relevant to the rest of the humanities and the natural sciences.

This book is not a biography. We are concerned with Chomsky's ideas, rather than the details of his private life. This is not through lack of interest. Fascinating snippets of information emerge from his interviews:[4] endearing tales of childhood visits to a baseball match with his schoolteacher or insights about his feelings when forced to take boxing at college.[5] However, Chomsky is "really a hermit by nature"[6] and has repeatedly emphasized that his personal views are irrelevant to his scientific ideas; indeed, that "to the extent that a subject is significant and worth pursuing, it is not personalized."[7] For those who want personal glimpses beyond the following few notes, the books by Barsky and the interviews with Barsamian, MacFarquhar, and Peck are the best sources (see Bibliography).

Chomsky was born on 7 December 1928. From the age of two, he spent ten years in a progressive Deweyite school in Philadelphia, where there was a congenial emphasis on individual creativity. From there he moved on to a regimented and stifling high school, about which he claims to remember "virtually nothing."[8] Thereafter he attended the University of Pennsylvania, where he met Zellig Harris,[9] a leading linguist and political theorist, who had a profound influence on his life, and the philosopher Nelson Goodman, another key figure. He graduated in 1949, with an undergraduate thesis about Modern Hebrew, that was later revised and extended as his master's thesis.[10] That same year he married Carol Schatz,[11] a fellow student who made a significant contribution to language and linguistics in her own right. She was to play a pivotal role in his life throughout their marriage of nearly sixty years until she died in December 2008. Shortly after their marriage Chomsky entered graduate school and in 1951 became one of the Society of Fellows at Harvard, from where he moved to the Massachusetts Institute of Technology (MIT) in 1955. He has been there ever since, although a large part of each year is devoted to traveling around the world giving countless lectures and interviews.

In 2014, after years of being alone, he married Luisa Valéria Galvão-Wasserman – an "unexpected joy."[12] She is translator for the Institute of Advanced Studies (IEA) of the University of São Paulo, Brazil, and for the house journal, *Estudos Avançados*. She is also a film producer and organizer of cultural events.

Apart from his major influence on linguistics, philosophy, and psychology, Chomsky has had a minor but not insignificant effect on a range of disciplines from anthropology to mathematics, from education to literary criticism. To understand this pervasive influence requires a grasp of the defining characteristics of Chomsky's scientific program of generative grammar, and some insight into the appeal of his social and political thought. What follows is an attempt to explain Chomsky's work by analyzing and putting into context the key contributions he has made to the study of language and the study of mind. This involves dealing with issues, some of them technical and profound, in linguistics, psychology, and philosophy.

His work in all these areas has been systematically innovative and systematically controversial. As well as genuine disagreement, misunderstanding of his views is widespread in all three communities of scholars, and part of our aim is to explain why it is that he has been both adulated and vilified. In some instances the task is straightforward. In others it is harder to see why the hostility is so uncomprehending. In the former category are differences about whether linguistics should be a psychological, ultimately biological, enterprise rather than a mathematical or sociological one with concomitant implications for the role of native speaker intuitions. Similarly, there are genuine differences of opinion about whether rigorous formalization and probabilistic modeling are necessary or desirable; whether linguists should aim for exhaustive coverage of the data from the language they are investigating or be content with attaining some insight in a more circumscribed domain; and in politics, to what extent it makes sense to plan out a better society in advance. In the latter category are the fulminations of those who accuse him of "play-acting at linguistics" and "clinging to falsehood,"[13] systematic lying, or of being an apologist for Pol Pot and the Khmer Rouge.

This book is intended to be accessible to everyone. Accordingly, all the notes containing detailed references, sources, explanations, brief elaborations, and suggestions for further reading are collected together at the end of the book. All quotations are identified there and it should be possible to locate any source in a few moments. References are in all instances to Chomsky's work, unless explicit indication to the contrary is given. Much of Chomsky's work is extremely technical and we have attempted to present his ideas as simply as possible in the interest of comprehensibility. Nonetheless, we have tried to represent Chomsky's views accurately and have not been afraid to use (and of course explain) technical terms when necessary. In every case, it is worth emphasizing that the linguistic examples we cite will need mulling over, if their implications are to be fully grasped.

Chapter 1 begins by putting language and the study of language in a wider context as part of the scientific investigation of human nature. This involves a discussion of the structure of mind, with evidence drawn from studies of both

normal and pathological cases of the dissociation of human faculties, and
with language as the "mirror of the mind." This opening chapter is followed
by a detailed and partly historical exposition of Chomsky's linguistic
theorizing, which constitutes the bedrock on which the rest is built. The
aim of this section is to give the reader some understanding of current theory
by showing how we got where we are. An account is given of the ideas for
which Chomsky is best known (deep and surface structure, for instance) and
why they are no longer part of his current Minimalist framework; but most
importantly, we try to give a flavor of the kind of argument that Chomsky has
used in his work over the last fifty years. The next two chapters are devoted
to the psychological and philosophical implications of Chomsky's work.
Chapter 3 looks at the vexed question of what is meant by psychological
reality, and provides evidence for it from language processing, from the
child's acquisition of a first language, and from language breakdown in
pathology. At the core of this chapter is a discussion of Chomsky's potential
solution to "Plato's problem," the puzzle of how children can acquire
their first language on the basis of so little evidence. Chapter 4 turns to
the philosophical aspects of Chomsky's ideas, outlining his intellectual
commitments to rationalism, mentalism, and naturalism, and explaining
the controversies which have sparked so much debate in the philosophical
community. The final chapter is devoted to a discussion of his political ideas
and how these fit in intellectually with his "academic" work. Despite
Chomsky's own disavowal of any very close connection, it is argued that
there are fundamental ideas of rationality, creativity, and modularity which
draw the disparate strands of his output together. The book ends with an
annotated bibliography.

The task of summarizing Chomsky is daunting, and we are conscious
of Leonardo da Vinci's complaint that "abbreviators do injury to
knowledge."[14] Chomsky's output is vast: he has published over a hundred
books, hundreds of articles, and written tens of thousands of letters. His
mastery of a huge literature is awe-inspiring: in current affairs throughout
the world, in politics, history, linguistics, philosophy, psychology, math-
ematics. . . there are few areas where he has no knowledge. To achieve this
mastery of many fields demands "fanaticism" plus, in his words, the ability
and dedication to "work like a maniac." It also takes immense courage,
ceaseless energy, and the sacrifice of any leisure. He wrote: "It takes a big
ego to withstand the fact that you're saying something different from
everyone else." He views his own contribution as "pre-Galilean,"[15] though
Berlinski is probably right to consider him "As big as Galileo."[16] At the
end of the sixteenth century Galileo founded the experimental method which
underpins the whole of modern science;[17] by the end of the twentieth century
Chomsky was generally viewed as the most important originator of the

cognitive revolution which has begun to extend that method to the study of the mind.

Not everyone shares this positive evaluation of him. The philosopher Richard Montague reportedly called him one of the "two great frauds of twentieth century science" (the other was Einstein, so at least he was in good company);[18] the linguist Paul Postal says that "everything he says is false ... He will lie just for the fun of it";[19] he has been vilified as an "opportunist, ... applauder of corruption, and apologist for government indifference to protests against war and colonialism";[20] he has been called the "great American crackpot" and "outside the pale of intellectual responsibility."[21] In the 1960s and 1970s he was repeatedly detained by the police because of his political activism,[22] and he has frequently been the victim of death threats.[23] Even those who are basically sympathetic to his position sometimes accuse him of being simplistic, or "paranoid,"[24] or of showing "willful naiveté,"[25] and suspect that he sometimes wins arguments for the wrong reasons, wishing that he might "try admitting that, just sometimes, he has got it wrong."[26] As Carol Chomsky somewhat ruefully put it: "one never wins an argument with Noam,"[27] even when, on reflection, one is convinced one is right. This polarization of opinion demands explanation, and one of the reasons for writing this book is to provide the foundations for such an explanation. Chomsky says: "You have a responsibility to explain why what you are doing is worth doing."[28] For us, his work is illuminating,[29] but we think much of it is under-appreciated and worth broadcasting more widely, so we have tried to distill the essence into a few brief chapters.

Inspiration and influence

Most people need heroes to act as role models, whose exploits they can emulate or, more mundanely, simply use as a basis for defining the kind of activity it is appropriate, morally defensible, and at least partly feasible to follow. This is not the mindless homage of hero-worship, though the adulation Chomsky receives is often embarrassing.[30] Close scrutiny usually leads to the discovery that one's heroes – like everyone else in the world – have feet of clay, which can be an encouragement if it puts them on the same mundane plane as oneself. So Chomsky is not a "hero," though we are happy to admit that he has been an inspiration for us. It does not follow that we always agree with him, though if we didn't agree with him on many issues, we almost certainly wouldn't have written this book: we do not identify with those who idolize political leaders because of their strength of leadership, irrespective of the direction in which they lead.

For Chomsky "Nobody is a hero,"[31] and he usually avoids answering questions about whom he admires,[32] though the list of those who have

influenced him and whom he respects is lengthy. It includes anarchist thinkers like Mikhail Bakunin, Peter Kropotkin, and Rudolf Rocker; the left Marxist Anton Pannekoek; a long series of philosophers: Descartes, Humboldt, and Rousseau; John Dewey and Charles Sanders Peirce; more recently Wittgenstein,[33] Nelson Goodman and W. v. O. Quine; linguists like Zellig Harris and Otto Jespersen; and libertarians like A. J. Muste and Bertrand Russell ("one of the very few people that I actually admire").[34] At a greater remove, it would doubtless include Galileo, Kant, and Newton. Some of the influences are less obvious than others: Ahad Ha-'am, a cultural Zionist at the turn of the century, whose work was later considered not only to be anti-Zionist, but to show "an excess of rationalism," was an early influence on both Chomsky and his parents.[35] His father, William Chomsky,[36] not only influenced him politically, but also exposed him early in life to classical Semitic philology: his book *Hebrew: The Eternal Language* (dedicated to Noam and his brother) appeared in the same year, 1957, as his son's *Syntactic Structures*, the accepted beginning of the Chomskyan revolution.

Despite his ability to overthrow the edifices he has himself created, there is a consistency about his moral commitments and the intellectual founda-tions of his work, that clearly date to his childhood and early adulthood. His views are never adopted unthinkingly, and none of the influences is accepted uncritically. In linguistics as in politics Chomsky has a striking ability to see to the heart of issues. In both domains he defends the insights of those whose general position he has no time for and criticizes the perceived failings of his intellectual allies. Intellectually, he is perhaps closest in spirit, as well as achievement, to Darwin, who wrote to his friend and mentor Henslow: "I believe there exists, & I feel within me, an instinct for truth, or knowledge or discovery, of something [the] same nature as the instinct of virtue, & that our having such an instinct is reason enough for scientific researches without any practical results ever ensuing from them."[37]

1   The mirror of the mind

> One reason for studying language – and for me personally the most compelling reason – is that it is tempting to regard language, in the traditional phrase, as "a mirror of mind."
>
> (Chomsky, 1975a: 4)

Frogs are not like us.[1] They are better at catching flies but not, it seems, at explaining how they do it. The frog mind is narrowly specialized to control tasks such as locating small black specks, escaping predators, and finding mates, but not for reflecting on the ethics of eating insects or the issue of equal rights for toads.

This view of the limited intellectual capabilities of amphibians is unlikely to be controversial.[2] If we extended it to apes the reaction might be different, and it would clearly be false of humans. How do we know? Because humans can tell us so and the others cannot. Although having a language is not a prerequisite for having a mind, language is overwhelmingly our best evidence for the nature of mind. Language is definitional of what it is to be human, and the study of language is a way in to the study of the human, but not the frog, mind.

Despite the complexity and variety of animal communication systems, no other creature has language like ours. Although chimpanzees and bonobos can be taught to manipulate an impressive array of signs and use them to communicate with us or with each other, human language, in particular the syntax of human language, is *sui generis*.[3] As far as we know, even the singing of whales and the color communication of cuttlefish have nothing like (human) syntax. Surprisingly, the closest parallel with human language, more accurately speech, is found in birdsong.[4] It is surprising because birds and humans are evolutionarily only remotely related, suggesting that the many shared properties of birdsong and speech are the result of convergent evolution rather than shared descent, although such analogic convergence may be controlled by the same genetic mechanisms, reflecting "deep homology."[5] In one respect our linguistic uniqueness is trivial: the inherent interest of our abilities would not be diminished just

because it turned out that other species had even more in common with us than we had previously suspected. But if we want to understand what we are – how we are unique – our linguistic ability is central, and Chomsky's work in generative grammar provides the most important and radical insights in this domain. He has achieved this by studying language with the rigor and the methodology of the natural sciences in combination with the philosophical insight of the Cartesian tradition in a way that had previously never been attempted.

In this chapter we look first at the implications of the assumption that linguistics should be part of the natural sciences, and then at the position of language in relation to the rest of cognition. This involves investigating a range of human abilities,[6] their interrelations and dissociations, the contrast between knowledge of language and the use of that knowledge, and taking a first glance at questions of innateness and the relation of language to thought.

Linguistics as a science

Linguistics had long been defined as the scientific study of language, but the science was restricted to taxonomy and a naïve methodology. Hockett, one of the leading figures of the American structuralism that Chomsky's revolution replaced, opens one of his early papers with the definitional claim that "linguistics is a classificatory science."[7] One of Chomsky's achievements has been to make plausible the claim that linguistics is scientific in the more interesting sense that it can provide not only explicit descriptions but also explanations. There are several strands to such a claim. The first is that linguistics provides a general theory explaining why languages are the way they are: each language is a particular example of a universal faculty of mind, whose basic properties are innate. The second is that the theory should spawn testable hypotheses: like a physicist or a biologist, the linguist manipulates the environment experimentally to see what happens and, crucially, he or she may be wrong. The experiments are usually not as high-tech as those in the hard sciences, but they allow for testing: if your analysis entails that English speakers should find *John speaks fluently English* as acceptable as *John speaks English fluently*, then it is wrong and must be replaced by a better one. A corollary of this emphasis on seeking testable explanations is that the central concern is evidence rather than exhaustive collection of data, where by "evidence" we mean data that help to show which theory is right and which is wrong.

Every linguist (a term which is ambiguous between theorist of language and polyglot) has suffered the question "So how many languages do you speak?" It is often hard to convince people that the answer doesn't really matter. Having a little knowledge of half a dozen languages is less useful than knowing one language with native proficiency. You may be reasonably fluent in French, for

instance, without being quite sure whether the French equivalent of the unac-
ceptable English sentence above is acceptable or not: "Jean parle couramment
l'anglais." If you're not sure, your knowledge is of little more use than an
unreliable balance. Even if we assure you that it is acceptable, and that this
reflects a systematic difference between the two languages, this is still just
another fact until it can be used as evidence for some particular theoretical
assumption, at which point it may acquire vital importance for deciding
between conflicting theories.

Linguistics before Chomsky (and in many cases even now) was preoccu-
pied, like Linnaean botany or Victorian entomology, with achieving
complete coverage of the respective fields. Examples are legion, from
Hjelmslev's *Prolegomena*,[8] which begins with the claim that linguistic
theory must permit descriptions which are "exhaustive," to current versions
of Construction Grammar,[9] which criticizes the generative paradigm
because "it doesn't allow the grammarian to account for absolutely
everything in its terms." It is essential to collect enough data to guarantee
representative coverage – missing out marsupials in a taxonomy of mammals
would be a serious omission – but Chomsky's view is that trying to achieve
exhaustive coverage is a wild-goose chase, and such criticisms are miscon-
ceived. His view is, of course, controversial, as witness not only the quotes
above but also the appearance of an influential and widely-cited article
"The myth of language universals," which attempts to falsify the generative
paradigm by emphasizing that "[l]anguages are much more diverse in
structure than cognitive scientists generally appreciate."[10] It is true that the
set of linguistic facts is potentially infinite, but facts which can be used as
evidence for some particular hypothesis are much harder to come by.
Consider word order in a little more detail.[11]

Different languages have different word orders: in some, like English,
sentences are typically of the form Subject Verb Object (SVO), so we say
Frogs eat flies; in others, like Japanese, they are of the form Subject Object
Verb (SOV), so the equivalent sentence would have the order *Frogs flies eat*; in
yet others, like Arabic, they are of the form Verb Subject Object (VSO), with
the order *Eat frogs flies*. Assuming that it makes sense to talk of different
languages having different characteristic word orders, it was suggested some
years ago that all the world's languages fell necessarily into one of these three
types (SVO, SOV, and VSO). The suggestion was plausible because these are
the three orders where the subject precedes the object which, given our own
language background, feels logical. To test this claim it's no use just collecting
more examples of languages like the ones mentioned: it's easy to find hundreds
more languages that conform to the generalization. What is needed is a list of
the world's languages sufficiently exhaustive to tell us whether there are any
exceptions: languages with the word orders VOS, OVS, or OSV. As it happens,

the suggestion was wrong: all these types do occur (although the last two in particular are extremely rare), so *all* the six logically possible orders are attested.[12] It follows that, as far as this particular observation is concerned, there is nothing more to be said. Whatever language one looks at next, it will fall into one of the six types listed, because there are no other logical possibilities, so every language will exemplify one of the possibilities we already know about. Even the signed languages of the deaf manifest the same kind of word-order differences as spoken languages.[13] Accordingly, if word order were the only consideration of interest, there would be no point in trekking off to the Highlands of New Guinea to search for another example of something we already have.

Of course we still have innumerable interesting questions: Why are some of these orders so rare? What other properties, if any, correlate with the word order manifested by a particular language? What happens when we consider indirect objects and adverbs, and other possible additions? It may well be that evidence about these issues will come precisely from as yet unknown languages, but to investigate these constructively we need more, and more complex, hypotheses. Our knowledge of language and languages is by now sufficiently complex that we are more likely to gain insight by looking in greater depth at well-studied languages than by looking superficially at relatively unknown ones. One of us (NVS) spent a fascinating year learning and studying the Nupe language of Nigeria,[14] and has used the language ever since to check out various claims about the human faculty of language, but many of the things in need of checking are beyond his Nupe abilities and he has to have recourse to his native intuitions in English or to the native intuitions of speakers of Nupe to settle the issue.

At this point you might rightly object that saying English is SVO is too simplistic, because many sentences diverge from this favored pattern. In *What do frogs eat?* or *Flies are what frogs eat*, the object appears at the beginning of the sentence, hence before the subject. Such orders occur systematically in English and cannot just be ignored, even if other deviations are characteristic only of poetry or archaic forms of the language and can perhaps be safely left out of consideration. For instance, archaic word order is preserved in the saying *What the eye doesn't see, the heart doesn't grieve*. Here the heart is the object of grieve, so the expression means (or meant) that what you don't see doesn't "grieve your heart." There is a sense in which such sayings are part of English, but to infer from this that English word order allows the object either to precede or to follow the verb would be grossly misleading, predicting that *Frogs flies eat* is on a par with *Frogs eat flies*; which it patently is not. Indeed, to bring the saying into conformity with their form of English, many people have changed it to *What the eye doesn't see, the heart doesn't grieve over*, thereby making *the heart* unambiguously the subject of *grieve*.