Introduction

As did the first edition, this second edition of *The Cambridge Companion to Chomsky* includes specially written chapters that discuss topics in three of the important intellectual areas to which Noam Chomsky has made significant contributions. While contributors to the first edition wrote some of the chapters, most of the contributors to this second edition are new. All essays are new.

Again like the first edition, chapters are written for the intelligent general reader. Some of them assume a little technical knowledge, and a couple of them a bit more than that. No one should have much difficulty with the chapters in the philosophy of language/mind section or those in the politics one. But given that one of the aims of this new edition is to address changes and progress since 2005 in Chomsky's work on the science of language, several of the authors who discuss Chomsky's work in linguistics had to assume that readers would have at least some background knowledge of the topic(s) under discussion. Nevertheless, even readers new to Chomsky's approach to the science of language who are willing to read carefully should be able to understand the issue(s) taken up in a particular linguistics chapter, with the possible exception of the last one. Those who want more background can go to the first four chapters in the linguistics section, and to all those in the first edition. And anyone who wants a brief introduction to the issue(s) in question in a particular chapter might find it in the summaries I provide in Part 3 of this introduction.

In the sections that follow, I begin (Part 1) with an overview of what has been constant in Chomsky's intellectual work, what has changed, and what has made progress. Then (Part 2) I sketch Chomsky on biology and – more generally – on human nature conceived of as the subject of various natural sciences. For as I suggest later, Chomsky appears to believe that humans are creatures of nature, and only that – he seeks a native basis (but not a cause) in a distinctive evolved human nature even for our moral, aesthetic, and social judgments and actions. And in a final section (Part 3), I summarize some of the issues taken up by authors in specific chapters.

1 The Same, the Different – and Progress

Chomsky's political and economic views do not seem to have changed in any fundamental way since his early teens, perhaps even before. They were then and are now opposed to power and authority and its exercise where there is no good justification for it. And they are strongly in favor of social systems that enable people to maximally satisfy their needs for creativity within communities in which they can fully participate in all communal decisions that affect them and their opportunities, including economic ones. Those characteristics are reflected in the labels he assigns to social systems he supports: "libertarian socialist" and "anarchosyndicalist." The basic principles of his political-social-economic view inform all the long- and short-term policies he supports, given available social and economic conditions. The aim throughout is progress. Except perhaps in extreme cases, he does not recommend violent revolution: the loss in life and hard-won support institutions and the high probability of one authoritarian government replacing the destroyed one make the cost far too great.

Because Chomsky realizes that policies must respect existing conditions and the realistic prospects of success in achieving progress, he has often had to compromise his ideals. For example, in recent decades he has compromised anarchist-libertarian principles by advocating increased government regulation of corporations, perhaps especially financial institutions. This compromise is, however, motivated by an effort to improve the opportunities for individuals to work together to take control of the now only nominally democratic social and economic institutions in which they participate as citizens and make them more truly democratic. Doing so – he judges – will make progress toward establishing a socioeconomic system that better offers individuals opportunities to act freely and creatively along with finding satisfaction in establishing social bonds under conditions of freedom.

There are other examples of compromise in the interests of progress. Chomsky (who with his wife Carol were early kibbutz participants) very early advocated on grounds of fairness and cooperation that the state of Israel be a binational federal state with equal rights and opportunities for Palestinians. But outright rejection of that cooperative egalitarian view by others, Israeli militarism and ever-increasing Israeli encroachment on Palestinian territory, along with support from the United States in arms and UN Security Council vetoes forced an early and still-continued advocacy of a two-state solution to the "Palestine Question" – one that honors the 1967 Israel borders, with perhaps a few adjustments. Chomsky continues to advocate a binational state but realizes that as it stands, it is out of the question. For history and discussion, see Gendzier (Chapter 15, this volume).

Note that history, often diverging from official versions that distort in order to justify entrenched power and authority, informs all of Chomsky's political and social works. His extensive historical study of Israel and its relations to the Palestinians and the United States in *The Fateful Triangle*, amply supplemented in recent years and currently with speeches and papers that update the historical record, is one example. There are many more: detailed studies of mainstream press coverage of "benign" and "nefarious" atrocities, histories of U.S. and British imperialism, details of Reagan administration economic and military imperialism in Central America, accounts of the war on drugs and some of its aims (social control of blacks, funding of "security"), details of the legislative-judicial transformation of corporations into "people," public funding of corporate bailouts, publicly funded research handed over to corporations. These are a few. Apparently, he hopes that fact-based detailing of the aims and effects of power and authority will make individuals aware of how little economic and political control they actually have, so that they will organize to improve their conditions. The hope is not empty: that many do so respond suggests that his view of humans as creatures needing freedom and community to thrive is correct (Chomsky 1987, 1988a, 1988b; McGilvray 2014).

There are some large targets, such as capitalism (Derber, Chapter 12, this volume; Rai 1995, 2005). This economic system gave ordinary individuals greater control of economies than did earlier ones, but – Chomsky notes in many works – when capitalist forms of economy began in the nineteenth century and increasingly since (with some setbacks from unions and regulation but advances too, such as legislative/judicial decisions that made corporations into perpetual people) to increasingly provide private power in the form of corporations the ability to control not just economic policy but government and even judicial policy, the result is what we find at the time of writing in the United States. A few wealthy citizens make economic decisions and through bribery and threat take effective control of government and judiciary, creating plutocracies with neoliberal socioeconomic policies. The ironic outcome is a supposedly 'free market' economic system that is anything but free and a statist neoliberal polity in which wealth controls a state that protects wealth from market discipline by – among other things – bailouts using public funds, tax loopholes, union busting, and tax haven "arrangements." Considerable proportions of populations in some nominal democracies – approximately 75 percent in the United States now – have become virtual wage slaves who must work at low-paying and unfulfilling jobs in order to live while corporations with government support export jobs to cheap labor states with little union power and poor environmental regulation. And foreign policy, backed by military power, serves corporate "needs." Legislation is turned toward serving the interests of the

wealthy by legislators who seem to be able to justify themselves and their actions by apparently managing to believe trickle-down economics and tough love principles, despite massive evidence to the contrary. Again, presenting history and data in his writing and talks, Chomsky hopes that ordinary individuals will come to realize how disadvantaged they are, and will organize to make progress toward a more egalitarian socioeconomic system.

Employing history and data to criticize or encourage as he does, Chomsky assumes that history is a record of human effort in the creation and abuse of institutions such as parties, governments, economies, corporations, unions, and religions. Institutions are human creations and must be seen to be. If there is to be social and political progress, decent people must organize and bring it about by creating equable and just institutions.

Turning to what is the same and what is different in Chomsky's views on the mind and its study (i.e., his views on the philosophies of mind and language), it is important to see that they are closely related to his views on the *natural science of language*. Intuitively, the idea is this: the best philosophical pictures of the mind and its components are those that reflect successful natural science studies of the mind and its components. Assuming so, the successes achieved suggest conceiving of the mind as made up of multiple native (innate) systems, sometimes called "modules." And they indicate that it is best to focus research on the component systems themselves, not on the mind or organism as a whole, its environment, and the behaviors the mind or organism engenders. That is because natural science methods seem to best lead to success (by natural science standards) where cognitive scientists employing them focus on mental systems that are "natural organs," meaning by that systems that develop or grow in accord with a biologically and physically prescribed agenda that requires some input (experience), but – gross pathology or genetic damage aside – where the input only shapes the internal system within dimensions prescribed by natural law and genetically set growth agendas (through genetic regulatory systems). There is plasticity, but it is limited. For the most part, the developing mind grows by and through the maturation of its various systems, and the systems come to assume stable mature states. The internal systems no doubt provide the cognitive tools that an organism can use to solve problems in various ways through its behaviors/actions. But – Chomsky seems to hold – there is little chance of ever developing a natural science of an organism's behavior, or developing a natural science theory of the way(s) that on any given occasion a mind as a whole responds to environmental input. In sum: if you want a natural science of mind, look to native internal systems or "mental organs." That is where you will be able to make progress in your efforts to be a cognitive scientist. Of course, you can achieve that

progress only if your science of a mental system addresses the available and achievable evidence of biological (including evolutionary) and physical constraints that condition the growth of mental systems (Chomsky 1965, 1995a, 1995b; Berwick and Chomsky 2011, 2016; Chomsky and McGilvray 2012).

2 Chomsky and Biology

Human biology – particularly as it has come to be understood in the "evo-devo" (evolution-development/growth) form it has recently assumed – has a prominent place in much of Chomsky's thought. I sketch three ways in which this is so.

2.1 Chomsky and Biology: The Challenge of UG

Both what allies us with other creatures and what makes us unique depend on our biological natures – our genomes – and the ways in which the genome contributes to development or growth – embryogenesis and beyond. Among the features of the current human genome is some property (probably not a single nucleotide) or properties that enable humans to develop or grow a natural language. No doubt we descended from a line of apes that also led to a line of chimpanzees, but a very long time ago – at least 2.5 million years for the split from chimps and bonobos that yielded a group of various hominim species. Anatomically modern humans have been in place for approximately 200,000 years, and it is usually assumed that it is only during the past 200,000 (at the most)[1] and 60,000 (at the least) years that our specific species *homo sapiens–L* (HSL)[2] developed, plausibly due to the evolution of Merge (and word-like entities or "atomic concepts" (Chomsky 2013b) and then – likely later – means of expression). This distinguished HSL from any other hominim variety, for the introduction of language that has the

[1] The issues are not settled. Berwick (Chapter 4, this volume, section 3) suggests that perhaps the latest is rather something like 80,000 to 90,000 years ago, when there appeared "evidence of unambiguous symbolic activity associated with the Blombos cave stone ochre geometric engravings and other artifacts." He appears to assume that that symbolic activity would plausibly require both Merge (hence hierarchically structured expressions) and human concepts, plus perhaps a means of expression (perhaps speech or sign). As for the emergence of Merge and perhaps other language-specific materials (likely prior to speech/externalization), he speculates that that could even have preceded the emergence of anatomically modern humans, for the research he relies on indicates that the line that led to modern humans diverged from that for Denisovans and Neandertals some 565–700,000 years ago. For discussion, see his chapter and Berwick and Chomsky (2016).

[2] I use the term "*homo sapiens-L*" for humans with language. It is not standard usage. Standard terminology (*homo sapiens* and *homo sapiens sapiens*) is based primarily on anatomy, not cognitive capacity – which for current purposes is the important consideration.

hierarchically structured form of human languages created what amounted to a different species. The emergence of language yielded the extraordinary cognitive advantages available to HSL alone, with these advantages including at least the rudiments of those kinds of inquiry into "hidden" entities and forces that since the seventeenth century have taken the form of natural science as we understand it. At the very least, language offered humans ways of planning, critically assessing, engaging in fiction and fantasy, and inquiring that are unavailable to other creatures. No doubt in doing so it initiated the creation of institutions (such as political organizations), economies, and much of what we think of as culture. It enabled what Jared Diamond called "the great leap forward."

Chomsky has long tried to tie a natural science of language to biology, for it must be a mutation in a line of hominina that provided language to us. He sees his attempt to tie language to biology as an essential element of his natural science research into language. Specifically, describing and establishing this tie amount to an attempt to accommodate a natural science of language to the natural science of biology (perhaps align it with . . . , coordinate it with . . . , unify it with . . .). This effort to accommodate has been in place from almost the beginning of his study of language.

Reflecting this effort to accommodate the study of language to biology, the current label for Chomsky's program for natural science research into language is "biolinguistics." While this label for his research program is relatively new, accommodation to biology – as Berwick (Chapter 4, this volume) points out – has been an aim from close to the beginning of Chomsky's study of language. Perhaps not when he wrote his undergraduate thesis (*The Morphophonemics of Modern Hebrew*) in the 1940s or shortly after, but certainly from the time Chomsky, Morris Halle, and Eric Lenneberg met in the 1950s to read Austrian Konrad Lorenz's and Dutch Nikolaas Tinbergen's studies of obviously innate animal instincts and complex behaviors and their organism-specific triggering inputs (found in imprinting, for example), it was clear to him and the others that like the study of other complex and apparently innate behaviors, the study of language would have to seek the biological origin of this human-unique "instinct." Since Chomsky and his colleague Morris Halle were just beginning to use the methods of natural science to study language at the time, however, and because the initial theories of language (grammars proposed for natural languages) were far too complex to attempt to accommodate language to biology as it was then understood, accommodation was put on the back burner. It remained there until fairly recently, when the study of language within what Chomsky calls the "Minimalist Program" sufficiently simplified the theory-described core of the human language that accommodation could become a viable research prospect. Earlier, the research emphasis was on other aspects of the science of language, such as offering clear, explicit formal definitions of

languages (grammars that provide formalized descriptions of languages) and trying to explain the puzzle of how a child could acquire or 'grow' a language and reach full competence by the age of four, proceeding in what appeared to be a uniform, staged manner, no matter which language (Tagalog, Hungarian . . .). As it turns out, of course, simplification aids that project too.

While the term "biolinguistics" focuses on the specific task of accommodating language to biology, accommodation became possible only because of progress in simplification along with progress in achieving all the other aims of natural science research into the mind. Biolinguistics is just the most recent version of a project for the study of language that Chomsky earlier called "rationalism" (1966/2009), "methodological monism" (2000), or "normal science" (various). The term "rationalism" – derived from the views of rationalists such as Descartes – probably best reveals the central features of what sciences of the mind look like. That is because in addition to recommending the usual methodological aims of empirically based natural science, this label emphasizes that sciences of the mind best succeed when they focus entirely on the nature of an innate system in the head. Only by doing so can one produce a theory that is objective in the way natural sciences hope to be, universal (across HSL humans), and capable of explaining the acquisition facts (among other things). The theory is *not* a theory of linguistic behavior, or of other behaviors/actions informed by the resources that language provides, such as making articulated judgments concerning environments or the intentions of others. Of course, observations of linguistic behavior and other language-related manifestations and parallel manifestations of other internal systems can offer evidence that could help support or reject various hypotheses about internal systems, but the hypothesized mental sciences are not sciences of linguistic, visual, or proprioceptive behaviors or other observed (instrumentally or directly) phenomena – including (paleo)anthropological, ethological, archaeological, brain scan, or DNA observations and claims. Their subject matters are the elements and principles of internal systems themselves. Chomsky calls this inward-looking feature of sciences of the mind "internalism." So while rationalism and methodological monism do not appear to have much to do with biology, that is only because they emphasize general methodological aims rather than focusing on one of those aims, the substantive issue of how to accommodate a science of language (or of another mental system) to biology and growth/development (and to other natural sciences that bear on the growth/development and operation of language or another mental system). That is the focus of biolinguistics (and biovision, bioaudition, bio . . .). Of course, a crucial aspect of accommodating language or another apparently innate system to biology lies in providing a good explanation of the system's evolution. In the case of language, this proved difficult, for there are few known facts concerning language's evolution, and the only way to explain them required simplifying

the view of the HSL-unique innate genetic component that allows for the development of language systems that provide hierarchically structured conceptual complexes that Chomsky (1995a) called "perspectives." That is because the available evidence indicates that language evolved quickly, very likely – Chomsky argues – as the result of a unique evolutionary event that made possible (but likely did not itself enable) symbolic behavior, and since its evolution, it is found in the genomes of HSL breeding groups that have not been in contact with one another for at least 60,000 years when the migration of HSL humans from Ethiopian Africa began. To evolve quickly, it had to rely on a single, unique, and non-complex genetic change. And to be universal, it had to be transmissible in its unique simple form to all the progeny of the individual in which the evolutionary event took place. Its utility, while necessary for its selection, is secondary; it provides only for continuation of the mutation, not its nature – a nature that is not derived from an environment but from the character of the evolutionary event. The need to satisfy the natural science requirement of simplicity explains why progress in biolinguistics parallels that in what Chomsky calls the Minimalist Program (1995b). Minimalism is rationalist methodology that focuses on simplifying the universal genetic component, called Universal Grammar or UG. For discussion, see chapters by the contributors to the language and mind sections and Chomsky and McGilvray (2012).

Chomsky hypothesizes that this unique evolutionary event introduced what he thinks of as the genetically enabled central feature of language, the feature that must be present for an organism to acquire a natural language in the observed way HSL humans do. He calls that feature Universal Grammar, arguing that it is what provides for the recursive, hierarchically organized form of discrete infinity of expressions that the human language system can potentially yield (at least, when what he calls a "labeling algorithm" is operative (Chomsky 2013a, 2015)).

No doubt there were and still are many cognitive scientists (including evolutionary psychologists) who are undaunted by richness and complexity and even seem to embrace it, telling stories about how language could on their view have gradually evolved through many millennia through earlier hominina and perhaps even pre-hominina species a complex genetic component or group of components. Lewontin (1998; see also Hauser et al. 2014) throws ice water on these efforts: where there is no evidence in favor of a claim, and appears to be no possible evidence in favor of it, it is merely storytelling, not science. Chomsky honors that condition on good empirical science. That is why it was only after the evidence mentioned earlier became clearer and the Minimalist Program yielded success in simplifying UG that he and his colleagues have hypothesized that the evolutionary introduction of the recursive operation Merge sufficed to yield language, at least to the extent that one conceives of

language as a way of taking "atomic" concepts and placing them together to produce those hierarchically arrayed conceptual complexes of word meanings Chomsky (1995a) called "perspectives," or what might be called "thoughts." For this hypothesis, expression or externalization of thought through sound, sign, or other perceptually accessible medium is secondary and might well have turned out to be a later development. That later development could count on the fact that there were means of expression in place – chimps and various hominina, for example, had the mechanical requirements for sign available. But having means of expression alone is irrelevant, as the failure of efforts to teach a natural language to chimps have clearly indicated (Petitto 2005). UG so conceived is the capacity to produce endless numbers of hierarchically arrayed conceptual complexes – basically, the meanings of sentences of natural languages, or language's contributions to the concepts that people use to configure their fictional, "real," imaginary, story-developed worlds. Not just chimps, but other creatures, including some songbirds and perhaps all vertebrates have the capacity to string together linear (flat) sequences of sounds or other form of signal and to "chunk" them in various ways. But no other creature can produce the hierarchically structured complexes that are characteristic of language, nor can any other creature acquire language in the way *homo sapiens-L* can. That is the basic claim.

In sum, the complex and rich nature of the nativist assumptions of early Chomskyan grammars and the impossibility of finding any evidence of gradual development of anything like a linguistic capacity in earlier hominids and primates prevented the introduction of serious proposals for language's evolution and thus for saying "why language is the way it is." As the result of Chomsky's and his colleagues' recent efforts at pursuing a Minimalist version of the natural science of language – one that advances further the methodological aims of natural science that have long been Chomsky's goal – we have in Merge (see both Hornstein, Chapter 3, this volume, and Epstein et al., Chapter 2, this volume) an austere Minimalist conception of what must be assumed to be biologically innate in the human genome.

Given language's uniqueness to the human species,[3] it is plausible to suggest that the evolutionary introduction of language played a major role in creating a unique hominid species displaying what is often called "human nature." It is often claimed (or perhaps merely assumed) that the creatures that have that nature are distinguished by having a cognitive ability philosophers and others call "reason." The term "reason" has many uses; for our purposes, we can think of it as a human problem-solving ability, a cognitive

[3] This claim is often disputed, but for no good reason that I am aware of. For compelling discussion, see Petitto (2005), and Berwick, Chapter 4, in this one. The uniqueness claim applies also to human concepts and lexical items (Berwick and Chomsky 2016: 147–148, and Yang 2013).

ability of humans expressed in the use of conceptual and conceptual-combinatory resources to think and plan, improvise and create, endorse and criticize, and generally make judgments and perhaps act on them, where this is conceived as a way humans have of forming and assessing views of this world and others, dealing with current and temporally distant matters, playing and engaging in serious thought, exploring and fantasizing, and so on – engaging in both practical and theoretical reason. The native tool for doing at least some of this – and perhaps the introduction of which is the necessary condition of doing *any* advanced form of it – is language. For plausibly, it is the language-based capacity to put concepts together in endless and structured forms without being caused to do so by inner or outer circumstances that gives humans the ability to withdraw from current circumstances and through this represent and articulate memories, plan, reconsider, critically assess, and speculate about past or future activities and actions in real, fictional, and theory-constructed worlds. There may be other evolved factors that make *homo sapiens-L* unique; music is sometimes proposed as an example, the universalizing features of moral thought (Mikhail, Chapter 11, this volume) and a universal form of aesthetic sense are others. But these may depend on language in one or more respects, and even if they do not and are unique to humans on their own terms, only language affords what it does, hierarchically structured conceptual complexes freed of circumstance and available to users ("reasoners") for use in comprehending in unique ways and the thinking that that allows. At the very least, then, language is a central contributor to what makes us cognitively distinct creatures; it is crucial in providing for our remarkable cognitive powers. In saying this I do not mean to suggest that language can be identified with its use in making judgments, thinking, reasoning, and the like. I mean rather that it provides for these and other uses by in effect making them possible. It enables them. People use language and other mental systems to solve problems – to reason. The mental systems do not *do* anything in this sense; people do. The point is Chomsky's: he emphasizes it in his early *Cartesian Linguistics* and *Language and Mind*, and often thereafter. Too many thinkers – including the majority of figures in the history of the study of language and mind from Plato and Aristotle on – ignore it and the confusions that ignoring it foster. Biological evolution and UG (or at the very least, whatever native and HSL-unique tools yield human concepts and hierarchically structured conceptual complexes) are logically, temporally, and instrumentally prior; reason as usually understood depends on them.[4]

[4] *Conscious* reasoning also requires a means of expression – perhaps sound. That is because conscious reasoning in language is a form of "inner speech."