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Decoding Chomsky

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Noam Chomsky is an enigma. To many, he is – and has been for 50 years – the most prominent and courageous academic opponent of his country's militarist ambitions around the globe. Yet among those who admire him on that score, few find it easy to relate to his seemingly obscure theories about language. The academic community acclaims Chomsky as the principal inspiration behind the so-called 'cognitive revolution' in psychology and related sciences – an intellectual development reflecting corporate pressures and initially sponsored by the United States military. This article investigates the paradoxical relationship between Chomsky's political activism and his science.

Introduction

Noam Chomsky ranks among the leading intellectual figures of modern times. He has changed the way we think about what it means to be human, gaining a position in the history of ideas – at least according to his supporters – comparable with that of Galileo or Descartes. Since launching his intellectual assault against the academic orthodoxies of the 1950s, he has succeeded – almost single-handedly – in revolutionizing linguistics and establishing it as a modern science.

Such victories, however, have come at a cost. The stage was set for the ensuing 'Linguistics Wars'[1] when, as a young anarchist, Chomsky published his first book. He might as well have thrown a bomb. 'The extraordinary and traumatic impact of the publication of *Syntactic Structures* by Noam Chomsky in 1957', recalls one witness,[2] 'can hardly be appreciated by one who did not live through this upheaval'. From that moment, the battles have continued to rage.

'Command and control'

How could a technical book on syntax have produced such dramatic effects? By his own admission, the author knew little about the world's different languages.

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Indeed, he outraged traditionalists by claiming he didn't need to know. Chomsky was not interested in documenting linguistic diversity. Neither did he care about the relationship between language and other aspects of human thought or life. As far as his opponents could see, he was not really interested in linguistics at all. He seemed to be more interested in computers.

By 1957, Chomsky's work in the 'Research Laboratory of Electronics' at the Massachusetts Institute of Technology was attracting the attention of the US military. It was not that they were disturbed about Chomsky's anarchist politics. Aware of his scientific activities, they were anxious to explore any possible military use. Moreover, they were in a position to pay. The preface to *Syntactic Structures*[3] concludes:

> This work was supported in part by the U.S.A. Army (Signal Corps), the Air Force (Office of Scientific Research, Air Research and Development Command), and the Navy (Office of Naval Research); and in part by the National Science Foundation and the Eastman Kodak Corporation.

Two large defence grants subsequently went directly to generativist – that is, Chomskyan – research in university linguistics departments. One went to the Massachusetts Institute of Technology in the mid-1960s and the other, a few years later, to the University of California, Los Angeles. *Aspects of the Theory of Syntax*[4] contains this acknowledgement:

> The research reported in this document was made possible in part by support extended the Massachusetts Institute of Technology, Research Laboratory of Electronics, by the Joint Services Electronics Programs (U.S. Army, U.S. Navy, and U.S. Air Force) under Contract No. DA36–039-AMC-03200(E); additional support was received from the U.S. Air Force (Electronic Systems Division under Contract AF19(628)-2487), the National Science Foundation (Grant GP-2495), the National Institutes of Health (Grant MH-04737–04), and the National Aeronautics and Space Administration (Grant NsG-496).

Several questions arise. Why did Chomsky – an outspoken anarchist and antimilitarist – take the money? Secondly, what did the military think they were buying? Both questions are sharpened by the fact that MIT at this time had no tradition in linguistics. This confronts us with a third puzzle: why was such military investment not directed to an institution with a proven record in linguistic research?

Explaining his decision to choose MIT, Chomsky recalls that he felt in no mood to serve in an established department of linguistics. He needed somewhere where original thinking could be freely explored:

> I had no prospects in a university that had a tradition in any field related to linguistics, whether it was anthropology, or whatever, because the work that I was doing was simply not recognized as related to that field – maybe rightly.

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> Furthermore, I didn't have real professional credentials in the field. I'm the first to admit that. And therefore I ended up in an electronics laboratory. I don't know how to handle anything more complicated than a tape recorder, and not even that, but I've been in an electronics laboratory for the last thirty years, largely because there were no vested interests there and the director, Jerome Wiesner, was willing to take a chance on some odd ideas that looked as if they might be intriguing. It was several years, in fact, before there was any public, any professional community with which I could have an interchange of ideas in what I thought of as my own field, apart from a few friends. The talks that I gave in the 1950s were usually at computer centers, psychology seminars, and other groups outside of what was supposed to be my field.[5]

As for the military, they saw much promise in Chomsky's scientific agenda. In a 1971 interview,[6] Colonel Edmund P. Gaines explained:

> The Air Force has an increasingly large investment in so called 'command and control' computer systems. Such systems contain information about the status of our forces and are used in planning and executing military operations. For example, defense of the continental United States against air and missile attack is possible in part because of the use of such computer systems. And of course, such systems support our forces in Vietnam.
>
> The data in such systems is processed in response to questions and requests by commanders. Since the computer cannot 'understand' English, the commanders' queries must be translated into a language that the computer can deal with; such languages resemble English very little, either in their form or in the ease with which they are learned and used. Command and control systems would be easier to use, and it would be easier to train people to use them, if this translation were not necessary. We sponsored linguistic research in order to learn how to build command and control systems that could understand English queries directly.

Chomsky's followers were by then engaged in just such a project at the University of California, Los Angeles, prompting Colonel Gaines to comment:

> Of course, studies like the UCLA study are but the first step toward achieving this goal. It does seem clear, however, that the successful operation of such systems will depend on insights gained from linguistic research …

The colonel went on to express the Air Force's 'satisfaction' with UCLA's work.

Versions of the machine

On the eve of the computer age, Chomsky's *Syntactic Structures* excited and inspired a new generation of linguists because it chimed in with the spirit of the times. Younger scholars were becoming impatient with linguistics conceived as the accumulation of empirical facts about locally variable linguistic forms and traditions. Chomsky promised simplification by reducing language to a

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mechanical 'device' whose design could be precisely specified. Linguistics was no longer to be tarnished by association with 'unscientific' disciplines such as anthropology or sociology. Instead, it would be redefined as the study of a 'natural object' – the specialized module of the brain which (according to Chomsky) was responsible for linguistic computation. Excluding social factors and thereby transcending mere politics and ideology, the reconstructed discipline would at last qualify as a natural science akin to mathematics and physics.

If a theory were sufficiently powerful and simple, reasoned Chomsky, it should radically reduce the amount of knowledge needed to understand the relevant data. As he explains:[7]

> In fact, the amount that you have to know in a field is not at all correlated with the success of the field. Maybe it's even inversely related because the more success there is, in a sense, the less you have to know. You just have to understand; you have to understand more, but maybe know less.

Syntactic Structures infuriated established linguists – and delighted as many iconoclasts – because its message was that much of the profession's work had been a waste of time. Why laboriously list and classify anthropological observations on the world's variegated languages if a simplifying short-cut can be found? In an ice-cool, starkly logical argument that magisterially brushed aside most current linguistic theory, *Syntactic Structures* evaluated some conceivable ways of constructing the ultimate 'language machine':

> Suppose we have a machine that can be in any one of a finite number of different internal states … the machine begins in the initial state, runs through a sequence of states (producing a word with each transition), and ends in the final state. Then we call the sequence of words that has been produced a 'sentence'. Each such machine thus defines a certain language; namely the set of sentences that can be produced in this way.[8]

As his argument unfolds, Chomsky rules out his first, crude design for the envisaged machine – it clearly wouldn't work. By a process of elimination, he then progressively narrows the range of designs that – on purely theoretical grounds – ought to work. Thrillingly, Chomsky opens up the prospect of discovering in effect 'the philosopher's stone': the design specifications of a 'device' capable of generating grammatical sentences (and only grammatical ones) not only in English but in any language spoken (or capable of being spoken) on earth.

Syntactic Structures itself, as it happened, proved unequal to this extraordinary task. Aware of this, Chomsky in his next book[4] proposed a completely different design for his machine – variously known as the *Aspects* model or as the Standard Theory. This in turn, however, had to be abandoned when the mathematical linguists Stanley Peters and Robert Ritchie demonstrated that the class of

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grammars described by the new model was so all-encompassing as to be vacuous. A device built in such a way, they showed, would be quite extraordinarily stupid. In fact, it would be unable to distinguish between (a) any conceivable list of strings of symbols, arbitrarily selected and combined and (b) a list of actual strings used by humans for expressing themselves in, say, English.[9] As one critic put it,[10] Chomsky's new model would be about as good as 'a biological theory which failed to characterize the difference between racoons and lightbulbs'.

Responding to all this in the early 1970s, Chomsky introduced a number of changes, offering what became known as the Extended Standard Theory, or EST. By the late 1970s, further changes seemed required, leading to the Revised Extended Standard Theory, or REST. Realizing that this was still unsatisfactory, in 1981 Chomsky published his *Lectures on Government and Binding*[11]which swept away much of the apparatus of earlier transformational theories in favour of a much more complex approach. In its 'Principles and Parameters' incarnation, the language machine becomes a box of switches linked to connecting wires:

> We can think of the initial state of the faculty of language as a fixed network connected to a switch box; the network is constituted of the principles of language, while the switches are the options to be determined by experience. When the switches are set one way, we have Swahili; when they are set another way, we have Japanese. Each possible human language is identified as a particular setting of the switches – a setting of parameters, in technical terminology. If the research program succeeds, we should be able literally to deduce Swahili from one choice of settings, Japanese from another, and so on through the languages that humans can acquire.[12]

Without abandoning this extraordinary dream, Chomsky has since jettisoned most of the specifics in favour of yet another attempted solution – known as the 'Minimalist Programme'.[13] It is hard not to suspect that should this in turn be discarded, the patience of even Chomsky's most ardent supporters may run out.[14]

Linguistics as physics

To his academic colleagues in the humanities and social sciences, Chomsky's programme has caused predictable astonishment, exasperation and even outrage. How could Chomsky imagine it possible – even in principle – to construct a 'device' enabling scientists to 'deduce' the languages currently or historically spoken across the world?

In replying to such critics, Chomsky accuses them of misunderstanding science. To do science, Chomsky explains,[15] 'you must abstract some object of study, you must eliminate those factors which are not pertinent … .' The linguist – according to Chomsky – cannot study humans articulating their thoughts under concrete social or historical conditions. Instead, you must replace reality with an abstract

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model. 'Linguistic theory', Chomsky[16] declares, 'is primarily concerned with an ideal speaker-listener, in a completely homogenous speech-community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance'. In this deliberately simplified model, children acquire language in an instant.[17] The evolutionary emergence of language was also an instantaneous event.[18] For Chomsky, 20th century English word meanings – for example 'carburettor' or 'bureaucrat' – are not culturally or historically determined. On the contrary, the meanings of these and other lexical items – in all languages whether past, present or future – became fixed during the origin of our species, being timeless components of our genetic inheritance.[19] Humans speak not for social reasons, but in expressing their genetic nature.[20] Speech is the natural, autonomous output of a specialized computational mechanism – the 'language organ' – installed inside the brain of every human on earth.

In his capacity as a natural scientist, Chomsky correspondingly sees people as 'natural objects' and their language a 'part of nature'.[21] Linguistics as a discipline 'falls naturally within human biology'.[22] However, this is not biology as normally understood. Discussing how language may have evolved, Chomsky suggests:

> The answers may well lie not so much in the theory of natural selection as in molecular biology, in the study of what kinds of physical systems can develop under the conditions of life on earth … .[23].

Language's features may be 'simply emergent physical properties of a brain that reaches a certain level of complexity under the specific conditions of human evolution'.[24] Alternatively, Chomsky[18] has speculated that

> … a mutation took place in the genetic instructions for the brain, which was then reorganized in accord with the laws of physics and chemistry to install a faculty of language.

As if willing to try anything, his most recent suggestion has been that language's recursive structure emerged suddenly as a spandrel – an accidental by-product – of unspecified other developments connected with, say, navigation or mind-reading.[25]

For Chomsky, linguistics can aspire to the precision of physics. The reason for this is that language itself is a 'natural object'.[26] As such, it approximates to a 'perfect system' – an optimal solution to the problem of relating sound and meaning. Biologists, according to Chomsky, do not expect such perfection, which is a distinctive hallmark of physics. He explains: 'In the study of the inorganic world, for mysterious reasons, it has been a valuable heuristic to assume that things are very elegant and beautiful'. Chomsky[27] continues:

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> Recent work suggests that language is surprisingly 'perfect' in this sense … . Insofar as that is true, language seems unlike other objects of the biological world, which are typically a rather messy solution to some class of problems, given the physical constraints and the materials that history and accident have made available.

Language, according to Chomsky, lacks the messiness we would expect of an accumulation of accidents made good by evolutionary 'tinkering'. Characterized by beauty bordering on perfection, it cannot have evolved in the normal biological way.

It is easy to understand why computer engineers might find it useful to treat language as a mechanical 'device'. If, say, the aim were to construct an electronic command-and-control system for military use, then traditional linguistics would clearly be inadequate. The requirement would be for a version of language stripped free of 'meanings' in any human emotional or cultural sense, cleansed of politics – and stripped also of poetry, humour or anything else not accessible to a machine.

But military figures such as Colonel Gaines were not the only people hoping to benefit from the new approach. What of Chomsky's other institutional sources of support and what about his own fiercely anti-militarist, anarcho-syndicalist politics? How did an anti-capitalist revolution connect with the 'revolution' Chomsky inaugurated in linguistics? Indeed, can the two sides of Chomsky's output be reconciled at all? Was the young anarchist tailoring his theories to meet the requirements of his military sponsors – forcing us, perhaps, to question the sincerity of his anarcho-syndicalist commitments? Or did he believe he was taking the money – refusing to let this influence his scientific results – in order to secure the best possible position from which to promote the anarchist cause?

Chomsky's politics

Chomsky's childhood education came largely from a lively working-class culture dominated by the radical Jewish intelligentsia of New York. At an early age, he was affected by the outcome of the Spanish civil war. 'The first article I wrote was an editorial in the school newspaper on the fall of Barcelona, a few weeks after my tenth birthday'.[28] Chomsky describes the defeat as 'a big issue in my life at the time'.[29] By his 12th birthday, Chomsky had completely rejected the politics of the Communist Party and, inspired by Barcelona's anarchists, he adopted their defeated cause and in subsequent years has never abandoned it.

Chomsky rejected not only Stalinism but also Leninism, which he associated with elitist attempts at indoctrination of the people. The Spanish anarchists, he felt, didn't try to educate the masses by imposing a rigid ideology from above. They believed in self-organization and everyone's capacity – once personally and politically liberated – to contribute to the revolutionary cause. 'I do not doubt',

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Chomsky writes,[30] 'that it is a fundamental human need to take an active part in the democratic control of social institutions'. The 'fundamental human capacity', in his view, 'is the capacity and the need for creative self-expression, for free control of all aspects of one's life and thought'.[31] Contemporary capitalist society ensures rewards for the more selfish tendencies in human nature. 'A different society' however, 'might be organized in such a way that human feelings and emotions of other sorts, say solidarity, support, sympathy become dominant'. Chomsky continues:

> We may only hope that human nature is so constituted that these elements of our essential nature may flourish and enrich our lives, once the social conditions that suppress them are overcome. Socialists are committed to the belief that we are not condemned to live in a society based on greed, envy, and hate. I know of no way to prove that they are right, but there are also no grounds for the common belief that they must be wrong.[32]

Chomsky and academia

In 1945, Chomsky entered the University of Pennsylvania:

> I entered with a good deal of enthusiasm and expectations that all sorts of fascinating prospects would open up, but these did not survive long, except in a few cases … At the end of two years, I was planning to drop out to pursue my own interests, which were then largely political.[33]

While actively opposing the establishment of a Zionist state in Palestine, Chomsky met Zellig Harris, a passionate advocate of Arab-Jewish co-operation. According to Chomsky, Harris possessed 'a kind of semi-anarchist strain to his thought'. It so happened that he was also a charismatic professor of modern linguistics. Chomsky, in his own words, was at this time 'a kind of college dropout, having no interest in college at all because my interest in a particular subject was generally killed as soon as I took a course in it'. Just 'to have something to do,' however, he decided to study linguistics under his new friend Harris. Gradually, 'I got interested in the field and sort of put it at the center of my concerns'.[34]

Although he 'got interested', however, Chomsky felt by no means qualified. His father had been a noted Hebrew scholar, imparting to Noam a lasting interest in mediaeval Hebrew grammar. But on attending college, he encountered structural linguistics – for which he felt no enthusiasm at all. Neither was he attracted by linguistic anthropology or current versions of psychology. Under Harris' influence, Chomsky instead took courses in philosophy and mathematics, 'fields in which I had no background at all, but which I found interesting, in part, no doubt, thanks to unusually stimulating teachers'.[35]

As an anarchist, Chomsky naturally distrusted the state, large institutions in general, and the university and all its functionaries. Disaffected intellectuals of

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this kind, according to one historian[36] 'are less vulnerable to the corruption of title and salary because their resistance is moral, almost instinctual'. Chomsky respected science, especially mathematics and physics. By the same token, he was deeply suspicious of the so-called 'social sciences', regarding them as patently ideological. Chomsky dreamed of ridding linguistics of such contamination. He would do this by detaching the discipline from its current institutional affiliations and rendering it purely formal – if possible, purely mathematical. Was it no more than a happy coincidence that this was exactly what the nascent computer industry – and its military sponsors – required?

The behaviourist background

Up until this time, speech had been allocated to 'culture', in turn thought of as 'learned behaviour'. During the 1940s and 1950s, the standard paradigm in psychology had been behaviourism – championed in the Soviet Union by Pavlov and in the United States most prominently by B. F. Skinner. Skinner's new book, *Verbal Behaviour*,[37] claimed to explain language as a set of habits built up over time. Rats, Skinner showed, can be trained to perform extraordinarily complex tasks provided two basic principles are followed. First, the tasks must be broken down into graduated steps. Second, the animal under instruction must be appropriately rewarded or punished at each step. This type of learning was termed by Skinner *operant conditioning*. Building on his work with rats, Skinner[38] argued:

> The basic processes and relations which give verbal behaviour its special characteristics are now fairly well understood. Much of the experimental work responsible for this advance has been carried out on other species, but the results have proved to be surprisingly free of species restrictions. Recent work has shown that the methods can be extended to human behaviour without serious modification.

Skinner accordingly treated human language in stimulus-response terms, identifying 'meaning' with the habituated response of the listener to speech-stimuli repeatedly heard. Language was conceptualized as structured like a chain, learned by associating one link via appropriate approval or 'reinforcement' to the next.

Planners and social engineers – among them Stalin in the Soviet Union – welcomed behaviourism because it seemed to promise enhanced techniques for mass education, pacification, political manipulation and control. Stimulus-response psychology, as one historian observes,[39] encouraged industrial managers in the belief that securing compliance meant finding in the workforce which buttons to push and pushing them. Or as Chomsky[40] succinctly puts it:

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> Those who rule by violence tend to be 'behaviorist' in their outlook. What people may think is not terribly important; what counts is what they do. They must obey, and this obedience is secured by force.

The language instinct

Two years after publishing *Syntactic Structures,* Chomsky published his celebrated review of Skinner's *Verbal Behaviour.* He had been wise enough not to take issue with, say, the sophisticated school of child psychology pioneered in the Soviet Union by Lev Vygotsky[41] or the subtle and fruitful insights developed by the Swiss developmental psychologist Jean Piaget.[42] Despite major differences with psychoanalysis, these psychologists had echoed Freud in taking for granted that humans, like other animals, must have deep-rooted instincts of some relevance to a study of the mind. Chomsky, however, refrained from acknowledging the existence of such intellectual giants. By singling out behaviourism for attack and ignoring everything else, he succeeded in arranging the battleground to suit his own needs.

Chomsky's review of *Verbal Behaviour* succeeded, it would seem, beyond its author's wildest dreams. Published in the journal *Language* and subsequently splashed across the front cover of *The New York Review of Books,* the 'case against B. F. Skinner' set in motion a tidal wave of revolt against a school of thought increasingly perceived as Orwellian in its project to shape and manipulate human life.

It was not difficult for Chomsky to associate traditional linguistics with Orwellian aims. Leonard Bloomfield was the major figure in American linguistics between the wars. In 1929, he told the Linguistics Society of America:[43]

> I believe that in the near future, in the next few generations, let us say, linguistics will be one of the main sectors of scientific advance, and that in this sector, science will win through to the understanding and control of human conduct.

Following the Second World War, reviewing the undesirable conduct of large numbers of military personnel and insurgents worldwide, many of Bloomfield's professional colleagues in the United States saw themselves living 'at a time when our national existence and possibly the existence of the human race may depend on the development of linguistics and its application to human problems'.[44] The wave of McCarthyite witch-hunting which swept the United States during the 1950s was in part premised on the belief that critics of 'the American way of life' must clearly have been brainwashed by communists. In this bitter Cold War context, linguistics was seen as a crucial weapon in the worldwide struggle for mastery and control.

Against this backdrop, Chomsky found it easy to present his antithesis as politically attractive and even liberating. Chomsky is withering in his response

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to the notion – still prevalent in left-liberal circles to this day – that a child must be taught its natal tongue through social pressure, training and example:

> Attention to the facts quickly demonstrates that these ideas are not simply in error but entirely beyond any hope of repair. They must be abandoned as essentially worthless. One has to turn to the domain of ideology to find comparable instances of a collection of ideas, accepted so widely and with so little question, and so utterly divorced from the real world. And, in fact, that is the direction in which we should turn if we are interested in finding out how and why these myths achieved the respectability accorded to them, how they came to dominate such a large part of intellectual life and discourse. That is an interesting topic, one well worth pursuing …[45]

How can language be an ordinary acquired skill? What kind of 'skill' is it when humans everywhere in the world 'learn' it in basically the same way and in equal measure? Languages – Chomsky points out – are not like other cultural patterns. They are not more or less complex, more or less sophisticated, according to the level of technological or other development. While differing from one another grammatically and in other ways, every human language is an equally intricate, complex intellectual system; none can be described as more or less sophisticated or 'advanced'.

In all cultures, moreover, people speak fluently regardless of social status, training or education. There is an innate biological schedule for language acquisition, specifying at what age a new language can easily be mastered and at what age the task becomes virtually impossible. While young children take quickly and easily to learning a new language, adults encounter immense difficulties, often making recurrent basic errors and revealing a permanent tell-tale accent despite years of trying. Young children not only learn easily: in linguistically impoverished environments, they may creatively invent improvements, developing a language more systematic than any they have heard. It is as if they knew by instinct how a proper language should be structured, anticipating regularities and establishing them inventively where necessary.[46]

The syntactical skills of children mastering a language, Chomsky points out, are acquired with extraordinary rapidity and in unmistakably creative ways. The child is not just assimilating knowledge or learning by rote: on the contrary, what comes out seems to exceed what goes in. Children hear relatively few examples of most sentence types, are rarely corrected, and encounter a bewildering array of half-formed sentences, lapses and errors in the language input to which they are exposed. Yet despite all this, they are soon fluent, creatively producing sentences never heard before, knowing intuitively which sequences are grammatical and which are not. In Chomsky's words:[47]

> The fact that all normal children acquire essentially comparable grammars of great complexity with remarkable rapidity suggests that human beings are

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> somehow specially designed to do this, with data-handling or 'hypothesis-formulating' ability of unknown character and complexity.

It is as if humans had an instinct for language.

Chomsky: politics or science?

In accepting military funding for his early language research, Chomsky risked accusations of political corruption. How could an anarchist do such a thing? As if fending off such attacks, Chomsky went out of his way to clarify his political stance. Showing unusual courage, he actively helped organise civil disobedience in opposition to the United States' war effort in Vietnam. As the political system is currently constituted, Chomsky[48] argues, policies are determined by representatives of private economic power. In their institutional roles, these individuals 'will not be swayed by moral appeals' but can only be affected by the 'costs consequent upon the decisions they make'. Chomsky and his allies seemed vindicated when, after the Tet offensive of 1968, the joint Chiefs of Staff pointed out that the deployment of additional troops to Vietnam was being hampered by the need to ensure that 'sufficient forces would still be available for civil disorder control' at home.[49] During these and subsequent years, no American public figure did more to put the record straight on the United States' military invasion of Vietnam than Noam Chomsky. Other left-wing intellectuals may not have felt quite the same need to deny personal culpability for their country's actions around the world. Chomsky experienced this need as intimate and morally inescapable.

However, simply to clarify his political stance was not enough, Chomsky's overall programme had to appear consistent. He could hardly afford to let his critics suggest that although his politics were progressive, his linguistic theories were clearly reactionary. His anarcho-syndicalism and antimilitarism had to be constructed as consistent with his linguistics. Somehow, the corporate backed and financed 'cognitive revolution' in psychology and related sciences had to be presented as intrinsically liberating and consistent with Chomsky's political beliefs.

He did not have to look far for a solution. Chomsky projected the 'language device' of his electronics laboratory into the brain of the human child. In real life, the human brain is not composed of wires or switch-boxes of the kind a 1950s computer engineer might devise. But if Chomsky's electronic 'device' could henceforth be conceptualized as a feature of the maturing human brain, it would nonetheless solve a number of pressing problems.

Central to anarchism is the celebration of spontaneity and self-organization. It must have occurred to Chomsky that a machine defined as autonomous – as freely

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controlling its own 'creative' output – would fit into the anarchist scheme of things. Chomsky could now claim that his commitment to what looked like a box of electronic tricks had a deeper political significance. The commitment in reality was to a resistant and creative human nature. Children don't need to be taught language by external pressure or example because – thanks to the special 'device' in their brains – they know the basics already. We 'can know so much', as Chomsky[50] explains,

> because in a sense we already knew it, though the data of sense were necessary to evoke and elicit this knowledge. Or to put it less paradoxically, our systems of belief are those that the mind, as a biological structure, is designed to construct.

If human mental nature is intricately structured and resistant, it must set limits to authoritarian control:

> If, indeed, human nature is governed by Bakunin's 'instinct for revolt' or the 'species character' on which Marx based his critique of alienated labor, then there must be continual struggle against authoritarian social forms that impose restrictions beyond those set by 'the laws of our own nature', as has long been advocated by authentic revolutionary thinkers and activists.[51]

Moving onto the offensive against his left-liberal critics, he explains:[52]

> For intellectuals – that is, social, cultural, economic and political managers – it is very convenient to believe that people have 'no nature', that they are completely malleable. That eliminates any moral barrier to manipulation and control, an attractive idea for those who expect to conduct such manipulation, and to gain power, prestige and wealth thereby.

In fact, according to Chomsky, revolution remains possible because of the deep-rooted human instinct to rebel and to remain free. As we learn a language, according to Chomsky, we are anarchists – not social conformists. The child acquires linguistic fluency in order to express its individual creativity:

> If some individual were to restrict himself largely to a definite set of linguistic patterns, to a set of habitual responses to stimulus configurations … we would regard him as mentally defective, as being less human than animal. He would immediately be set apart from normal humans by his inability to understand normal discourse, or to take part in it in the normal way – the normal way being innovative, free from control by external stimuli, and appropriate to a new and ever-changing situation.[53]

Celebrating a rebellious human 'nature', Chomsky repudiates the pessimistic view that humanity's 'passions and instincts' will forever prevent enjoyment of the 'scientific civilization' that reason might create. He concludes instead that 'human needs and capacities will find their fullest expression in a society of free and creative producers, working in a system of free association … .' 'Success in this endeavour', he continues,

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> might reveal that these passions and instincts may yet succeed in bringing to a close what Marx called the 'prehistory of human society'. No longer repressed and distorted by competitive and authoritarian social structures, these passions and instincts may set the stage for a new scientific civilization in which 'animal nature' is transcended and human nature can truly flourish.[54]

In defence of science

For Chomsky, so-called social science, premised on the idea that human nature doesn't exist, is irretrievably, hopelessly ideological and reactionary. Intellectuals embrace it not because it is true but, on the contrary, because it is a patent fiction required to keep people ignorant and confused. Writing of school education of the kind typical in the United States, Chomsky terms it 'a period of regimentation and control, part of which involves direct indoctrination, providing a system of false beliefs'.[55] Other components of the system, such as mass broadcasting, journalism and what passes for political debate, have the same basic function.[56]

For Chomsky, the only channels of communication that are free from such ideological contamination are those of genuine natural science. Chomsky disagrees passionately with those social theorists – including historians of science – for whom science itself is just another form of oppressive ideology. He admits that such suspicions have long found favour among his fellow anarchists:

> Within the anarchist tradition, there's been a certain feeling that there's something regimented or oppressive about science itself, that we should break free of the oppressive structures of scientific thinking, and so on. I'm totally out of sympathy with that attitude. There are no arguments that I know of for irrationality. I don't think the methods of science amount to anything more than being reasonable, and I don't see why anarchists shouldn't be reasonable.[57]

With the rise of postmodernism, Chomsky complains, science has become viewed as just another form of manipulative ideology. Whereas in the 1930s, he notes, progressive intellectuals were still running education classes for 'the workers' and writing books with titles such as Mathematics for the Millions, everything has now gone into reverse:

> Today's counterparts of these '30s left intellectuals are telling people, You don't have to know anything. It's all junk, a power play, a white male conspiracy. Forget about rationality and science. In other words, put those tools in the hands of your enemies. Let them monopolize everything that works and makes sense.[58]

Chomsky passionately opposes the idea that ordinary people needn't submit to intellectual discipline but are free to think what they like on any subject they like. Instead of urging us to 'break free of the oppressive structures of scientific thinking', he recommends respecting and upholding precisely those structures. For Chomsky, indeed, there is no other road to freedom. The compatibility

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between anarchist politics and science, according to Chomsky, is proven by numerous precedents including the work of Pyotr Kropotkin, whose great book, *Mutual Aid* – a celebration of co-operative self-organization in nature – was 'perhaps the first major contribution to "sociobiology" '.[59]

The difference between the humanities and the sciences, for Chomsky, is that scientists must cooperate with one another across space and time and therefore be honest in their dealings. In the humanities, by contrast, as in ordinary life, people are free to ignore or abuse one another, claiming whatever they please. In the humanities, scholars tend to feel threatened by science precisely because of its unrestrictedly cooperative nature. Equally, they feel threatened by ideas which are genuinely new. Chomsky admits that such defects may, to some extent, afflict disciplines within the natural sciences. But at least 'the sciences do instil habits of honesty, creativity and co-operation', features considered 'dangerous from the point of view of society'.[60] A student in a university physics department will hardly survive without being questioning; in the 'ideological disciplines', by contrast, originality is discouraged. Chomsky[61] complains that in the 'domain of social criticism the normal attitudes of the scientist are feared and deplored as a form of subversion or as dangerous radicalism'. For Chomsky, the culture of science is the real 'counter-culture' to the reigning ideology.[60]

For Chomsky, political pluralism doesn't license unqualified persons to intrude as they please into scientific debates. Since Copernicus and Galileo, we have known that the earth is round and that it encircles the sun – facts that remain true regardless of anyone's tribal or religious beliefs to the contrary. Those who have not mastered the literature relevant to astronomy or any other discipline – internalizing its terminology and conceptual structure – have nothing of interest to contribute and should therefore expect to be excluded:

> Look, in the physical sciences there's by now a history of success, there's an accumulated record of achievement which simply is an intrinsic part of the field. You don't even have any right to enter the discussion unless you've mastered that. You could challenge it, it's not given by God, but nevertheless you have to at least understand it and understand why the theories have developed the way they have and what they're based on and so on. Otherwise, you're just not part of the discussion, and that's quite right.[62]

Not part of the discussion

According to Chomsky, the so-called 'social sciences' amount only to political ideology, a defect extending naturally to sociologically conceived versions of linguistics. Consequently, it is right that such perspectives should be excluded from scholarly debate. Those who fail to understand this clearly haven't mastered certain foundational concepts intrinsic to the field. The crucial point for Chomsky

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is that 'society' lacks validity as a scientific concept. No natural language should be conceptualized as belonging to a social group. Neither should we imagine that in acquiring linguistic competence, children need social relationships; science cannot say anything about such phenomena. 'Mind' has no necessary connection with 'society'. To study mental phenomena is to examine aspects of brain structure and function. Ignoring the so-called 'social sciences', Chomsky's dream is to unify the sciences by integrating linguistics into an expanded version of physics:

> The world has many aspects: mechanical, chemical, optical, electrical and so on. Among these are its mental aspects. The thesis is that all should be studied in the same way, whether we are considering the motion of the planets, fields of force, structural formulas for complex molecules, or computational properties of the language faculty.[63]

Consistently with this project, Chomsky defines language as 'an individual phenomenon, a system represented in the mind/brain of a particular individual',[64] contrasting this with the earlier view of language as 'a social phenomenon, a shared property of a community'. De Saussure[65] wrote of language:

> It is the social side of speech, outside the individual who can never create nor modify it by himself; it exists only by virtue of a sort of contract signed by the members of a community.

The problem with such usage, Chomsky complains[64], is that it 'involves obscure socio-political and normative factors' about which science can have nothing to say.

Chomsky denies the relevance of social factors even when considering language acquisition by the human child. The infant's linguistic capacities, he explains, cannot be taught. Instead, they must be 'allowed to function in the way in which they are designed to develop'. After briefly discussing this topic,[66] he concludes:

> I emphasized biological facts, and I didn't say anything about historical and social facts. And I am going to say nothing about these elements in language acquisition. The reason is that I think they are relatively unimportant.

Superficial irrelevancies aside, Chomsky views language acquisition as independent of experience:

> No one would take seriously a proposal that the human organism learns through experience to have arms rather than wings, or that the basic structure of particular organs results from accidental experience. Rather, it is taken for granted that the physical structure of the organism is genetically determined … .[67]

Human mental structures develop in the same way. 'Acquisition of language', concludes Chomsky,[68]

> is something that happens to you; it's not something that you do. Learning

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> language is something like undergoing puberty. You don't learn to do it; you don't do it because you see other people doing it; you are just designed to do it at a certain time.

Chomsky in political perspective

Let us retrace our steps. Chomsky, the young anarchist, was faced with the problem of breaking into academia. Given his outspoken views, how was he to overcome the many obstacles that would naturally be placed in his way? It would appear that Chomsky found a way of turning his apparent political handicap into an advantage. Financially and institutionally, he knew that the requirement was for an agenda the precise reverse of anarcho-syndicalism. The 1950s represented the dawn of the new computer age. Key intellectual and technical developments were being funded by the American military. These and other corporate forces required a new version of cognitive and linguistic science, having little in common with what they saw as Marxist-inspired versions of sociology or anthropology. What was needed was a psychology and a linguistics completely stripped of social content or political awareness – a version of these disciplines rigorously re-engineered and fine-tuned to serve the computer age in the name of 'cognitive revolution'. But how could the left's 'natural' ascendancy in these disciplines be overturned? Corporate America needed someone of intellectual integrity – and preferably of unimpeachable political integrity – to act as its standard-bearer in organizing the necessary coup. Ideally, this person should not only be 'left-wing' in an ordinary, run-of-the-mill sense. The perfect candidate would be sufficiently left-wing to outflank everyone else in the race. Chomsky, in 1957, was the right person arriving in the right position at exactly the right time.

In the event, Chomsky forged an anti-behaviourist coalition linking much of the academic left with those corporate forces, including the military, who were underwriting the development of the nascent computer industry. It was an unholy alliance, and as such was destined to fall apart once the behaviourist enemy had been overthrown. Jerome Bruner[69] recalls:

> Now let me tell you first what I and my friends thought the revolution was about back there in the late 1950s. It was, we thought, an all-out effort to establish meaning as the central concept in psychology – not stimuli and responses, not overtly observable behaviour, not biological drives and their transformation, but meaning. … we were not out to 'reform' behaviourism, but to replace it.

'The cognitive revolution as originally conceived', Bruner continues,[69] 'virtually required that psychology join forces with anthropology and linguistics, philosophy and history, even with the discipline of law'. Once behaviourism had been toppled, however, Chomsky clarified that this was not his vision at all. As Bruner[70] explains:

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> Very early on … emphasis began shifting from 'meaning' to 'information', from the construction of meaning to the processing of information. These are profoundly different matters. The key factor in the shift was the introduction of computation as the ruling metaphor and of computability as a necessary criterion of a good theoretical model.

Information, as Bruner[71] points out, is a term designed to be indifferent with respect to meaning. In computational terms, information comprises an already precoded message in the system. Meaning is pre-assigned to messages. It is not an outcome of computation nor is it relevant to computation save in the arbitrary sense of assignment:

> According to classic information theory, a message is informative if it reduces alternative choices. This implies a code of established possible choices. The categories of possibility and the instances they comprise are processed according to the 'syntax' of the system, its possible moves. Insofar as information in this dispensation can deal with meaning it is in the dictionary sense only: accessing stored lexical information according to a coded address.

In integrating his new version of linguistics with computer science, Chomsky dispensed with concepts such as 'intention', 'context' and 'meaning' in favour of an insistent and relentless focus on 'syntax'. It was Alan Turing's great discovery that machines can be designed to evaluate any inference that is 'formally valid' – that is, valid by virtue of the internal syntax of the pre-installed code. No machine can genuinely talk, because speaking entails understanding what other speakers may have in mind as they draw on their memories and experiences of themselves and others on the biological, social, cultural, religious and other levels inhabited by human minds. Machines are, and always will be, hopeless at passing themselves off as humans. But, as Fodor[72] points out,

> you can build them so that they are quite good at detecting and responding to syntactic properties and relations. That, in turn, is because the syntax of a sentence reduces to the identity and arrangement of its elementary parts, and, at least in the artificial languages that machines compute in, these elementary parts and arrangements can be exhaustively itemized, and the machine specifically designed to detect them.

Such a system, however, cannot cope with vagueness, with polysemy or with metaphoric or connotative connections – in other words, with the stuff of human language. Consequently, Chomsky's followers simply stopped talking of meaning, replacing the idea with 'computability' instead. Linguists now spoke not of intention, belief or agency but of mechanical 'inputs' and 'outputs' – notions not too different, as Bruner[73] points out, from the 'stimuli' and 'responses' of the behaviourists who were supposed to have been overthrown.

Writing of Chomsky's overall scientific contribution, Geoffrey Leech[74] comments:

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> It has the advantage of maintaining the integrity of linguistics, as within a walled city, away from the contaminating influences of use and context. But many have grave doubts about the narrowness of this paradigm's definition of language, and about the high degree of abstraction and idealization of data which it requires.

The child-language specialist Elizabeth Bates[75] complains of the 'scorched earth' policy deployed by Chomsky and his allies to keep the opposition at bay.

While the overthrow of behaviourism was widely celebrated, the 'revolution' intended by Chomsky's corporate sponsors had nothing to do with the establishment of a science of human meaning. As these forces championed Chomsky in steering the 'cognitive revolution' along channels narrowly defined by their specific commercial and political goals, the intellectuals who had supported generativism 'from the left' felt betrayed. Had they been able to unite, they might have comprised a formidable intellectual and political force. In the event, however, Chomsky's politics served him and his sponsors well. Left-wing resistance to Chomsky's science was always tempered by respect for his moral and political integrity. How do you attack an 'enemy' who is on your own side? The ambivalence ended up simply paralysing the opposition, whose splits and disagreements left Chomsky with a free hand – which he used quite mercilessly. It is fair to say that most of those linguists and other creative thinkers whose contributions were excluded by Chomsky had political sympathies not vastly different from his own. Together, they could have mounted an impressive intellectual defence of the unity and autonomy of science. In the event, it was Chomsky's defection that sealed their fate. Alienated from the academic mainstream, this talented individual was in effect selected by corporate America to do an extraordinary double-act, playing the role of chief enforcer for the new corporate science at home, while using this very status to gain a hearing as the most eloquent academic critic of US policies elsewhere across the globe.[76]

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References

1. R. A. Harris (1993) *The Linguistics Wars* (New York and Oxford: Oxford University Press).
2. H. Maclay (1971) Linguistics: overview, in: D. Steinberg and L. Jakobovits (eds), *Semantics* (Cambridge: Cambridge University Press), p. 163.
3. A. N. Chomsky (1957) *Syntactic Structures* (The Hague: Mouton), p. 1

https://doi.org/10.1017/S1062798704000493 Published online by Cambridge University Press

4. N. Chomsky (1965) *Aspects of the Theory of Syntax* (Cambridge, Mass.: MIT Press).
5. N. Chomsky (1988) Interview, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), pp. 15–16.
6. F. J. Newmeyer (1986) *The Politics of Linguistics* (Chicago & London: The University of Chicago Press), pp. 85–86. It should be stressed that this source of funding dried up completely in the late 1960s.
7. N. Chomsky (1988) Interview, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), p. 17.
8. A. N. Chomsky (1957) *Syntactic Structures* (The Hague: Mouton), p. 18.
9. R. A. Harris (1993) *The Linguistics Wars* (New York and Oxford: Oxford University Press), pp. 179–180.
10. E. Bach (1974) Explanatory inadequacy, in: D. Cohen (ed), *Explaining Linguistic Phenomena* (New York: Wiley), p. 158.
11. N. Chomsky (1981) *Lectures on Government and Binding* (Dordrecht: Foris).
12. N. Chomsky (2000) *New Horizons in the Study of Language and Mind.* (Cambridge: Cambridge University Press), p. 8.
13. N. Chomsky (1995) *The Minimalist Programme* (Cambridge, MA: MIT Press).
14. F. Newmeyer (2003) Review article. *Language*, **79**(3), 583–599.
15. N. Chomsky (1979) *Language and Responsibility.* Interviews with Mitsou Ronat (New York: Pantheon), p. 57.
16. N. Chomsky (1965) *Aspects of the Theory of Syntax* (Cambridge, MA: MIT Press), p. 3.
17. N. Chomsky (1976) *Reflections on Language* (London: Fontana), p. 15.
18. N. Chomsky (1998) Language and mind: current thoughts on ancient problems. Part I & Part II. Lectures presented at Universidad de Brasilia, published in *Pesquisa Linguistica* **3, 4,** p. 17. Page references are to the English manuscript.
19. N. Chomsky (2000) *New Horizons in the Study of Language and Mind* (Cambridge: Cambridge University Press), pp. 64–66.
20. N. Chomsky (1976) *Reflections on Language* (London: Fontana), pp. 57–69.
21. Op. cit., p. 186.
22. Op. cit., p. 123.
23. N. Chomsky (1988) *Language and Problems of Knowledge. The Managua Lectures* (Cambridge, MA: The MIT Press), p. 167.
24. N. Chomsky (1991) Linguistics and cognitive science: problems and mysteries, in A. Kasher (ed.) *The Chomskyan Turn: Generative Linguistics, Philosophy, Mathematics, and Psychology* (Oxford: Blackwell), p. 50.
25. M. D. Hauser, N. Chomsky and W. T. Fitch (2002) The faculty of language: what is it, who has it, and how did it evolve? *Science*, **298**, 1569–1579.
26. N. Chomsky (2000) *New Horizons in the Study of Language and Mind.* (Cambridge: Cambridge University Press), pp. 106–33.

https://doi.org/10.1017/S1062798704000493 Published online by Cambridge University Press

27. N. Chomsky (1996) *Powers and Prospects. Reflections on Human Nature and the Social Order* (London: Pluto Press), p. 30.
28. N. Chomsky (1988) Interview, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), p. 13.
29. R. F. Barsky (1997) *Noam Chomsky: A Life of Dissent* (Cambridge, MA: MIT Press), p. 16.
30. N. Chomsky (1981) *Radical Priorities* (Montreal: Black Rose Books), p. 224.
31. N. Chomsky (1988) *Language and Politics*, C. P. Otero (ed) (Montreal: Black Rose Books), p. 144.
32. N. Chomsky (1988 [1976]) Language development, human intelligence, and social organization, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), p. 192.
33. N. Chomsky (1988) Interview, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), pp. 6–7.
34. N. Chomsky (1988) *Language and Politics*, C. P. Otero (ed) (Montreal: Black Rose Books), p. 119.
35. N. Chomsky (1988) Interview, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), p. 8.
36. R. Jacoby (1987) *The Last Intellectuals: American Culture in the age of Academe* (New York: Basic Books), pp. 96–97.
37. B. F. Skinner (1957) *Verbal Behavior* (New York: Appleton Century Crofts).
38. Op. cit., p. 3.
39. R. A. Harris (1993) *The Linguistics Wars* (New York and Oxford: Oxford University Press), p. 55.
40. N. Chomsky (1988 [1984]) The manufacture of consent, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), p. 131.
41. See for example L. S. Vygotsky (1987) *The Collected Works of L. S. Vygotsky, Volume 1: Problems of General Psychology*, translated by N. Minnick (New York: Plenum Press).
42. See for example J. Piaget (1929) *The Child's Conception of the World* (London: Kegan Paul, Trench, Trubner & Co).
43. L. Bloomfield (1970) *A Leonard Bloomfield Anthology*, C. F. Hockett (ed) (Bloomington: Indiana Press), p. 227.
44. R. I. McDavid (1954) Review of Warfel (1952), *Studies in Linguistics*, **12**, 27–32.
45. N. Chomsky (1988) *Language and Problems of Knowledge. The Managua Lectures* (Cambridge, MA: The MIT Press), pp. 137–138.
46. L. R. Gleitman and E. L. Newport (1995) The invention of language by children: environmental and biological influences on the acquisition of language, in: D. N. Osherson (ed), *An Invitation to Cognitive Science*, *Volume 1, 'Language'* L. R. Gleitman and M. Liberman (eds) (Cambridge, MA: MIT Press), pp. 1–24. For a more wide-ranging treatment of this and related issues see S. Pinker (1994) *The Language Instinct* (London: Penguin).
47. N. Chomsky (1959) Review of B. F. Skinner's Verbal Behavior. *Language* **35**(1), pp. 26–58, 57.

https://doi.org/10.1017/S1062798704000493 Published online by Cambridge University Press

48. N. Chomsky (1985) *Turning the Tide: US Intervention in Central America and the Struggle for Peace* (Boston: South End), p. 252.
49. M. Rai (1995) *Chomsky's Politics* (London: Verso), p. 115.
50. N. Chomsky (1976) *Reflections on Language* (London: Fontana), p. 7.
51. Op. cit., p. 133.
52. R. F. Barsky (1997) *Noam Chomsky: A Life of Dissent* (Cambridge, MA: MIT Press), p. 208.
53. N. Chomsky (1972) *Problems of Knowledge and Freedom* (London: Fontana), p. 100.
54. N. Chomsky (1976) *Reflections on Language* (London: Fontana), p. 134. Note Chomsky's argument that revolutionary social change might liberate – and hence confer novel significance upon – distinctively 'human' aspects of our genetic nature. For the application of this idea to the origins of language, see C. Knight (2002) Language and revolutionary consciousness, in: A. Wray (ed), *The Transition to Language* (Oxford: Oxford University Press), pp. 138–160.
55. N. Chomsky (1988) *Language and Politics*, C. P. Otero (ed) (Montreal: Black Rose Books), p. 6.
56. N. Chomsky (1988c [1984]) The manufacture of consent, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), pp. 121–136.
57. N. Chomsky (1988) Interview, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), p. 22.
58. N. Chomsky (1988 [1976]) Language development, human intelligence, and social organization, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), p. 128.
59. N. Chomsky (1988) *Language and Problems of Knowledge. The Managua Lectures* (Cambridge, MA: The MIT Press), p. 21.
60. Quoted in M. Rai (1995) *Chomsky's Politics* (London: Verso), p. 138.
61. N. Chomsky (1975) Towards a humanistic conception of education, in: W. Feinberg and H. Rosemount (eds), *Work, Technology, and Education: Dissenting Essays in the Intellectual Foundations of American Education* (Chicago and London: University of Illinois Press), p. 219.
62. N. Chomsky (1988) Interview, in: *The Chomsky Reader*, J. Peck (ed) (London: Serpent's Tail), p. 16.
63. N. Chomsky (1996) *Powers and Prospects. Reflections on Human Nature and the Social Order* (London: Pluto Press), p. 31.
64. N. Chomsky (1988) *Language and Problems of Knowledge. The Managua* Lectures (Cambridge, MA: The MIT Press), pp. 36–37.
65. F. de Saussure (1974 [1915]) *Course in General Linguistics*, translated by W. Baskin (London: Fontana/Collins), p. 14.
66. N. Chomsky (1988) *Language and Problems of Knowledge. The Managua Lectures* (Cambridge, MA: The MIT Press), p. 173.
67. N. Chomsky (1976) *Reflections on Language* (London: Fontana), pp. 9–10.
68. N. Chomsky (1988) *Language and Problems of Knowledge. The Managua Lectures* (Cambridge, MA: The MIT Press), p. 174.

https://doi.org/10.1017/S1062798704000493 Published online by Cambridge University Press

69. J. Bruner (1990) *Acts of Meaning* (Cambridge, MA: Harvard University Press), pp. 2–3.
70. Op. cit., p. 40.
71. Op. cit., p. 4.
72. J. Fodor (2000) *The Mind Doesn't Work That Way. The Scope and Limits of Computational Psychology* (Cambridge, MA: MIT Press), p. 13.
73. J. Bruner (1990) *Acts of Meaning* (Cambridge, MA: Harvard University Press), p. 7.
74. G. Leech (1983) *Principles of Pragmatics* (London: Longman Linguistics Library), p. 3.
75. E. Bates (1984) Bioprograms and the innateness hypothesis. *Behavioral and Brain Sciences*, **7**, 180–190.
76. Enormous creative energy has been generated through the collision of these opposing forces and it is not my aim to accuse Chomsky of political insincerity. His *Hegemony and Survival* (London: Penguin, 2004) is perhaps the most moving, powerful and courageous of all Chomsky's political contributions, suggesting – as I would like to believe – that in the internal battle here described, it is the anarchist visionary whose agenda ultimately wins out.

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Chris Knight is Professor of Anthropology at the University of East London. In addition to many journal articles, he is the author of *Blood Relations: Menstruation and the Origins of Culture* (1991) and co-editor of three recent edited volumes on the evolution of language and culture. He is currently part of a research team investigating initiation ritual in an East African hunter-gatherer population.

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