

Rhyme and Reason

An Introduction to Minimalist Syntax

foreword by Massimo Piatelli-Palmarini



```
#define S          /* seed shape */  
#define R          /* ray floret shape */  
#include M N O P  /* petal shapes */
```

```
 $\omega$  : A(0)  
p1 : A(n) : *  $\rightarrow$  +(137.5)[f(n0.5)C(n)]A(n+1)  
p2 : C(n) : n <= 440  $\rightarrow$  ~S  
p3 : C(n) : 440 < n & n <= 565  $\rightarrow$  ~R  
p4 : C(n) : 565 < n & n <= 580  $\rightarrow$  ~M  
p5 : C(n) : 580 < n & n <= 595  $\rightarrow$  ~N  
p6 : C(n) : 595 < n & n <= 610  $\rightarrow$  ~O  
p7 : C(n) : 610 < n  $\rightarrow$  ~P
```

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Rhyme and Reason

A Javier, en memoria de otras vidas

Unha dama entrou aquí,	A lady entered here,
Un pícaro entrou con ela.	A knave entered with her.
Xa se foi, mais está aquí.	She left, yet she's still here.
Qué diremos que foi dela?	What ever happened to her?

—Old Galician riddle

This dialogue is a gem. Rarely have I encountered, in an advanced and highly specialized field, a reconstruction that, like this one, is largely enjoyable by a novice, thought-provoking to the professional, and capable of illustrating with a delicate brush the rigorous internal logic of a whole domain. Language (or rather, our tacit knowledge of it) constitutes an unquenchable source of wonder. Children and adults alike take pleasure in exploring new subtle reverberations between sounds and meanings. In every culture, poems, rhymes, puns, limericks, riddles, jokes, and jeux de mots all testify to the multitude of enjoyments that are made possible, at varying degrees of depth, by the infinite use of a finite repertoire of linguistic materials. By reading this book, we fully realize exactly *why* this is so, and how far and how deep an explanation of this natural propensity can lead us. Also, thanks to a dazzling display of graphic inventiveness, Juan Uriagereka conducts in the universe of syntax and semantics an exploration not dissimilar from those to which we have grown accustomed in the universe of mathematics and pure logic. Readers who have been enthralled by *Gödel, Escher, Bach* may well like this syntactic companion as well, a sort of *Chomsky, Fibonacci, Bach* (the Fibonacci numbers, as explained in chapter 1, are the cornerstone of certain universal biological “harmonics”).

Juan Uriagereka is a leading member of the (by now) large international community of linguists working in the domain known as generative grammar. This field was created some forty years ago by Noam Chomsky, one of the towering intellectual figures of our time. Of Chomsky—and of the collective Linguist of the dialogue, a convenient single label that subsumes a collective mind, a kind of Bourbaki of linguistics powerfully inspired by Chomsky’s work—it can be said, according to the ancient tradition, “He solved the riddle of the Sphinx, and was a man most mighty.” Indeed, this book allows us to participate in one of the most fascinating conceptual adventures of our time. I anticipate that many readers will share the feeling of excitement that pervades the profession. How elating it is to discover that so much is going on these days! And that what’s in full progress affects our basic understanding of human nature.

The artful stratagem of the dialogue in fact allows the reader to accompany the discussants, step by step, through a systematic reconstruction of the foundations of modern scientific linguistics, all the way up to a very recent and still hotly debated theoretical turn called the “Minimalist Program.” Many researchers have grappled for long months with the seminal technical articles (and now a whole book) presenting this program. The least that can be said is that not every aspect of the new theory is yet crystal clear to every professional linguist. Chomsky’s recent technical work is particularly “bare” of glosses, dense, at times too rapid, at times allusive, occasionally somewhat disconcerting, and, as always, immensely stimulating. It is most welcome to be invited to explore the intricacies of this new theory under the patient guidance of an expert. Here and there we are also exposed to recent original contributions made by Richard S. Kayne, Howard Lasnik, Juan Uriagereka himself, and many more.

It is also fitting that the Linguist's partner in this exchange (the Other) be an encyclopedic physicist-mathematician, one of those intellectually omnivorous characters whom the French, with a faint shade of mockery, call a polymath. Conveniently, the Other is immensely smart; he is also immensely naive (at least at the outset) in all matters linguistic, but he happens to speak a vast number of languages. As the dialogue makes clear from the first day, the Other's relentless challenging of the Linguist is the engine that drives all motion—especially because the Minimalist turn makes linguistic theory resemble, strangely enough, more the theories we encounter in physics than the ones we encounter in biology. I say “strangely enough,” because, as Chomsky has rightly stressed, and as the Linguist relentlessly reminds us here, the language faculty is part of the genetic makeup of our species; therefore, the principles that guide it would not be expected to possess so much elegance and allow for so much deductive power. The organization of other organs, shaped as it is by the vagaries of biological evolution, usually does not offer such elegance and compactness. The dialogue aptly opens with many acute and intriguing considerations on this all-important and unexpected (and still rather tentative) conclusion.

Chomsky's new turn is a refinement and a radicalization of ideas and presuppositions that have been at the very heart of generative grammar since its inception. This dialogue offers constant reminders of the deeper roots of the new theory, and dutifully monitors for us what is new, what is not, and what represents a daring reinterpretation of antecedent positions. In fact, many ideas are genuinely novel and illuminating. Despite substantial continuity, the Minimalist Program is indeed a revolution within a revolution. This dialogue is both a general introduction to the field as a whole and a sophisticated series of advanced lectures on the most elusive ramifications of Minimalism. I, for one, learned much from it and found in it excellent reasons to reread the technical texts in a new light.

2

I know through long and often frustrating experience how difficult it is to explain to hard-nosed scientists what generative grammar is all about. Physicists and biologists often assume that linguistics is, by its very nature, destined to be the study of a class of behaviors, namely, “communicative” behaviors. Since linguistics deals with symbolic communication, and since behaviorism is a relic of the past, perhaps these scientists want to concede, by making this assumption, that linguistics cannot be a straightforward description of behaviors as such, but rather an inquiry into the “causes” of these behaviors. Moreover, in this era of sophisticated brain imaging, they guess that linguistics must somehow eventually link up with detailed explorations of neuronal structures, natural or artificial, and, presumably, with artificial intelligence. These scientists are somewhat baffled when one stresses that the main body of generative grammar in fact links up only occasionally and only rather peripherally with the study of the neural correlates of language. These may represent, mostly in cases of inborn or traumatic deficits, confirming or disconfirming indirect evidence, but not the kind of central data with which the discipline is concerned. The core of generative grammar, qua natural science of language, deals not with the causes

of verbal behaviors but with in-depth analyses of a kind of *knowledge*: humans' tacit and internally caused knowledge of language. It is not easy, either, to explain to a nonlinguist that the overlap with the most popular variants of artificial intelligence is at best slim, and more often than not highly conflicting. Now and then, generative grammar has something to gain from a machine model of the workings of its principles and parameters, but in the main such artificial embodiments are neither necessary nor sufficient. I cannot see it as an accident that the high priests of the most popularized brands of artificial intelligence often take pride in professing ignorance of, and indifference to, the very fundamentals of generative grammar.

Reduction to neurology, at least "in principle," is often posited by the physicist and the biologist (and by many philosophers of language who ought to know better) as a preliminary, mandatory credential for generative grammar to be accepted as a natural science. Wisely, this dialogue faces head on the problem of reductionism and of the unification, by way of considerable new enlargements, of the more basic sciences. It very effectively refutes the assumption that either linguistics simply *is* advanced neurology in disguise or else it cannot even claim to be truly scientific. Nowhere have I seen this crucial and controversial problem discussed with such brilliance and thoroughness.

Strange as it may sound, generative grammar does not deal primarily and directly with languages as such (English, Chinese, Swahili, Tagalog, what have you), but, first and foremost, with naturally occurring individual computations of abstract structures that underlie the audible (or, in the case of sign languages, visible) expressions of those languages. These structures are specific to language, are part of human nature, and are instantiated in us effortlessly, incessantly, while we are intent on doing myriad other things. To most of these structures we have no conscious access, and it takes great subtlety, as well as a highly educated flair, to summon relevant linguistic evidence for or against a specific hypothesis. A point aptly made by the Linguist is that much of the traditional philosophy of mind and language is idle, because the most basic facts are drastically different from what they appear to be upon simple introspection or straight conceptual analysis. Thus, the systematic role that these abstract structures, by means of chains of internal computations (called derivations), play in determining the audible utterances and written expressions in the world's languages is of great concern to the generative grammarian. The central idea connecting what is hidden and what is manifest is that there is a *universal* set of principles, each of which leaves open a very narrow range of possibilities (literally to be counted on the fingers of one hand, or, in the limit, just one binary choice per principle), and that each particular language (or dialect, the distinction here being inessential) represents a specific set of choices, one for each of these possibilities, or parameters. Universal Grammar is thus instantiated in the mind/brain of the speaker of a given language or dialect by means of a complete set of specifications for (as it were) a panel of "switches" (this felicitous metaphor is due to James Higginbotham).

One might still think that the relation between the principles and parameters of Universal Grammar and actual spoken sentences is one of cause and effect, but this would be misleading. As Descartes warned, and as Chomsky has aptly reminded us all along, there

is no reason to believe that there are, strictly speaking, causes at all in this domain, in any sense of the term “cause” that is even moderately well understood. We say what we say, when we say it, to whom we choose to say it, because we freely decide to do so. Linguistic expressions are *neither caused by external circumstances, nor independent of them*. This is the well-known Descartes–Chomsky paradox, exhaustively explained in this dialogue. Linguistic utterances are prompted, but not caused, by external circumstances, and are always subject to an act of free will. It is always possible, but never necessary, to say something appropriate in a form suitable to a given occasion. The actual form of the utterance, if and when the speaker freely decides to emit it, is then generated via the processes detailed in this dialogue. It would be a grave mistake, though, to consider such mental machinery the cause of what we say, or even “the” cause of how we say it. The study of grammar is not a study of causes in any meaningful sense. It is, in fact, a study of human knowledge of language, and it is far from straightforward that knowledge may literally count as a cause. I can think of no other place in the literature where these notions, and the reasons that give them substance, are better presented than in this dialogue.

“Oh, *now* I see!”, our scientist is likely to say, in relief. “It’s a mathematical analysis of languages.” More bafflement ensues when one points out that the theory is not “mathematical” at all, although it has a formalism, a quasi-mathematical elegance, and a “formal logic” of derivations very much its own, and it definitely involves very abstract entities and operations. These are visualized with unparalleled effectiveness through the virtuoso graphic illustrations of this book.

Of special annoyance to the hard-nosed scientist, then, is the inevitable ensuing presentation of the typical data studied by the generative grammarian, namely, sentences from various languages and native speakers’ intuitions about them: “These are your *data*?! Do you expect me to take sentences and *intuitions* as data for a natural science?!” The linguist can well point out that there exist by now large corpora of quite robust and perfectly replicable data, collected over a long period of time from many languages—and, if this were not enough, that native speakers’ intuitions about grammaticality are in fact on a par with more standard perceptual judgments regarding, say, color vision, stereopsis, or motion perception, where the careful monitoring of these judgments (rightly) constitutes the foundation of most of the study of the psychology, physiology, and neurophysiology of perception. In fact, the linguist’s experiments are no less reliable for being simple, natural, and inexpensive. When the data are not so clear, linguists indeed use other, less direct methods (EEGs, eye movements, reaction times, rates of nonnutritive sucking in infants, and so on), being symmetrically repaid with less direct and less conclusive results. Gathering data straight from performance is fine as far as it goes, but defeasibility increases, because of interference from other factors besides the structures of language (limited attention span, memory failures, acoustic noise, etc.). Since the internal structures are what one is really after, it is vastly more desirable to probe directly into linguistic competence, tapping intuitions as such, as is unproblematically done in, say, decision theory, probability theory, naturalistic moral philosophy, much of economics, and just about all of logic. It is an obvious constraint on a scientific domain that it should account for scientists’ capacity

to gather evidence for or against its theories. Physics and biology do not put it down to some inexplicable wizardry that we are able to perceive motion, visually scan tracks on a photographic plate, read dials, and see things in a microscope. It is no miracle either that we develop reliable “intuitions” about the significance of these observations for the relevant theories.

Alas, these considerations do not always manage to impress the hard scientist, and sometimes, at exactly this point, the patience of our interlocutor is irretrievably lost, and the real-life dialogue between the physicist, or the biologist, and the linguist terminates abruptly. In this expository sense, I think it is wise of Juan Uriagereka to have kept the presentation of linguistic data to the strict minimum.

This book was indeed badly needed, and I am confident that, at long last, a good number of natural scientists will listen longer and find greater patience in following the arguments and examining the data. They will thus ascertain that this brand of linguistics is well on its way to becoming a full-blown natural science, offering a serious promise of an advanced field of scientific inquiry whose idealizations, abstractions, and deductions will eventually match in depth and subtlety those of the most advanced domains of modern science. Generative grammar is turning into a natural science already, because of what it is now, not because of what it might one day turn into, when neural imaging and neurobiology will have provided dramatic new refinements. Juan Uriagereka’s stratagem to motivate the scientific reader is a very early incursion into the vast scientific resonances of certain strategic choices. The big “whys” of contemporary linguistic theory are constantly interwoven with the “hows” and the “whats.” I anticipate that his stratagem will work.

I confine myself here to offering immediate motivations to sit down and listen. These introductory reflections are especially aimed at my former colleagues: physicists and biologists—that is, readers who are, like the Other, perfectly conversant with the natural sciences of a more standard variety, and curious about the facts of language.

3

In retrospect, we often see clearly that the most difficult task for an incipient natural science is to identify the right level of analysis and idealization, the primary objects that are observable at that level, and the most basic patterns of variation and invariance characterizing those objects. This difficult phase of idealization and abstraction precedes the construction of any theory and any attempt at explanations, and often steers the development of suitable techniques of observation and model building. It is legitimate to say that the triumphs of modern biology all originally derived from the intuition that the recurring patterns of similarities and differences between individuals of successive generations offer a privileged key to understanding the organization of living systems, and that the proper level of analysis is ultimately the molecular one. Of immense importance was first the intuition, and then the discovery, that even viruses and the simplest unicellular organisms possess a genetics in the full sense of the term, and that most of what is true of them (I

must insist, at the right level of idealization, not superficially) is also true of whales and people (here I am simply paraphrasing my former teachers, the French biologists and Nobelists Jacques Monod and François Jacob). The breakthroughs of modern biology, it is perhaps worth stressing, have been made possible by the systematic study of rather insignificant living creatures, such as the tobacco mosaic virus, the fruit fly, and intestinal bacteria, often grown in rather unusual and highly selective conditions. It is also worth stressing that millennia of casual observation of the most familiar and endearing animals had contributed next to nothing, from the scientific point of view, to our understanding of the basic underlying organization of living systems. I think that there are interesting conclusions for the scientific study of language to be drawn from these lessons of modern biology. They can help us understand some of the difficulties still encountered in vindicating the scientific status of the theories and the data presented in this book. I am old enough to remember a time when traditional biologists accused molecular biology of being contrived, myopic, based on artifacts and rare events. It rings a bell, therefore, when generative grammar is allegedly exposed for committing these very sins.

4

As this dialogue testifies, the study of syntax has by now accumulated excellent credentials for constituting a privileged window onto the organization of the human mind. Despite some forty years of healthy developments in linguistic theory, and the productive application of generative grammar to hundreds of languages and dialects of a typologically very broad range, this claim is considered highly debatable by many, and preposterous by some. In fact, our spontaneous casual fascination with language, the propensity for wonder and enjoyment to which I alluded above, is intrinsically unable to reveal that syntax is a primary, autonomous, and self-structured object of investigation. Indeed, our prescientific intuitions about language are bound to conceal that it is so. As the very opening of this dialogue aptly reminds us, if we approach syntax from top to bottom—that is, from the collective uses of language—we first encounter many layers of haphazard geopolitical contingencies and social conventions before we hit upon even the most generic systematicities of pragmatics and semantics. Syntax is often perceived as situated one level below this thin layer of pragmatic and semantic regularities, and subservient to them. (For expository purposes I am here deliberately using these terms according to the traditional classification: “syntax” as the study of systems of symbolic forms that are interpreted at a conceptual level; “semantics” as the study of the relations between expressions and things; “pragmatics” as the study of the use of linguistic expressions. But we will see shortly, and then much better in the dialogue, that it is far from granted that these standard demarcations can survive serious scientific scrutiny.) In such a traditional framework, then, the business of syntax is seen as one of freezing a set of “conventions” to string together contingent expressions for certain intentions to communicate. In this conception, what counts is the communicative intention itself, rather than the “contingent” form used to convey it. In this pragmatic and sociolinguistic perspective, syntax is a kind of adornment.

If, on the contrary, we move up from a utopianly “pure” physical characterization of the sounds of speech, we must ascend slowly, from amplitudes, frequencies, and temporal-spectral characteristics, to phonemes, from these to syllables, from syllables to words, and then from words to larger units. In this bottom-up perspective, the potential semantic ambiguities that arise in the attempt to combine words into larger units is what, allegedly, motivates syntax.

In the first approach (the top-down or pragmatic one), syntax is perceived as the mere “servant” of communicative aims. In the second (the bottom-up or physical one), it is perceived as a kind of peculiar “glue,” useful in cementing lexical meanings into more elaborate and flexible units of expression. Characteristically, both perspectives present syntax as requiring some kind of special justification, whereas it is considered easy to explain why we need parsing and pragmatics. There would be no language worth the name if we could not segment the physically continuous stream of speech into meaning-bearing units (that is, words). That’s why we need parsing. And even that would be worthless if we could not manage, somehow, to pin the individual words to relevant objects and events in the outside world. It thus appears obvious that we need parsing, and that we need to make use of words and their meanings. But then why are we endowed with all the intricacies and the complications of syntax? Why not stop at lexical semantics, perhaps adding some straightforward combinatorial rules on top? What is full-blown syntax for?

At this juncture, when the combination of word meanings is at stake, many think they can reply, “Syntax is there to reduce ambiguity.” This is the most “plausible” explanation being offered in certain quarters. It is pointed out that, whereas *peanut butter* is a butter made from peanuts, *snow boots* are boots worn for walking in snow, not boots made from snow. Likewise, *stone traffic barrier* is some device made of stone and used to regulate traffic, not a protection against trafficking in stones, whereas *steel bar prices* are monetary values of steel molded in the shape of bars. One then proceeds to calculate that the string of words *Pennsylvania state highway department public relations director* could produce, in the abstract, 132 logically possible meanings. Predicaments like these are (revealingly) used to sanction the eminent reasonableness of possessing a syntactic device, very expedient for blocking unwelcome combinatorial ambiguities. Juan Uriagereka offers many precise and compelling counterarguments to this naive move, especially in chapters 2 and 6.

Clearly, in any such reconstruction, syntax is not acknowledged as primary; instead, it is viewed as derived from something else, both ontologically and epistemologically. To use a term that is central to this dialogue, these approaches present syntax as an *interface* between communicative intentions and the articulation of the sounds of speech, a filter that is useful in making these intentions unambiguously manifest. This conception is exactly the opposite of what the Minimalist theory maintains, and generative grammar has maintained all along: that syntactic structures are primary. What one deals with is the streamlining of speech sounds, all the way up to the selection of words from the lexicon, and the scaffolding of the logical form (i.e., the systematic constraints on interpretation) that arise at two distinct interfaces. The first interface lies between syntax and the articulatory organs, the other between syntax and the conceptual system, extending into the array

of devices used to talk about the world, and express ideas, hopes, fears, desires. Syntactic computations, driven by powerful criteria of minimization, are truly universal, and it is they that determine various systematic constraints on sounds and meanings, not the other way around. As the dialogue makes clear, the specificity and the primacy of syntax do not mean that it stands in splendid isolation from everything else, in particular from all semantic questions. Yet they do mean that syntactic theory cannot be constructed from the demands of lexical recombinations plus some rules of thumb for clarity, usability, and mutual adjustment between speakers and hearers.

5

Curiously, right at this point evolutionary considerations come to the fore and constitute, in the eyes of many, a stumbling block. It is considered straightforward to justify semantics and pragmatics on adaptationist grounds, whereas it appears problematic to justify, on such neo-Darwinian grounds, the primacy of syntax. Many take it to be a necessary truth that syntax cannot be primary, because (so the story goes) survival pressures can only primarily shape the speed, accuracy, and representational power of *what* we say; they have no need to primarily shape *how* we say it. The how (syntax) must be derivative on more “basic” functional (communicative and simulative) needs. For reasons that are clearly laid out in this dialogue, generative grammar does clash with such impenitent adaptationism, and it therefore appears to collide with evolutionary theory. The crucial point, however, is that evolutionary theory must not be equated with strict adaptationism. It is one of the chief merits of this dialogue to offer perfectly convincing arguments reconciling generative grammar with evolutionary theory, while freeing it from the clamps of strict adaptationism.

In essence, the problem is, and always was, the following: no adaptationist approach to language (whether it is admitted or not) can select the right kind of syntactic organization on the basis of generic computation-optimizing constraints acting directly on sounds, interpretations, or uses. Indeed, these generic constraints cannot select any relevant type of syntactic organization over any other, and cannot even exclude some wildly implausible conjectures. The most elementary caricature invites us to imagine creatures that would form interrogatives, or negatives, by simply reversing the order of all words in a declarative sentence, creating its mirror image. No adaptationist consideration has managed to explain why we are not such creatures. More sophisticated fantasies of *prima facie* “possible,” but actually impossible, human languages (as explained in the dialogue) cannot be excluded on the basis of adaptationist considerations. It is arguably the single most important global result of over forty years of progress in syntactic theory that there has been no way of deriving the syntactic principles actually governing human natural languages from any generic constraint issuing from functional designs pertaining to motor control, communicative efficiency, memory load, “logical” perspicuity, minimization of ambiguity, or the like. It is also an interesting and important fact, which could not have been predicted, that our most highly developed theories of language (and this extends as well to other domains

of human cognition) are not computation-friendly and that conversely, much of what can be accomplished thanks to brute computational power sheds no light whatsoever on human capacities (even chess programs could not possibly achieve much if constrained to play with anything resembling human limitations on calculation). In the present technologically oriented climate this is a point worth stressing, to which I shall return shortly.

Some authors are persuaded that we have not tried hard enough, and that we should persist. They claim that an “explanation” of syntax by means of adaptationist criteria must, in the end, succeed, because otherwise the existence of language as we know it would be a “miracle.” They allege that, in the absence of *generic* functional constraints on linguistic abilities shaped by a *specific* advantage in terms of survival value, the origins of syntax would be simply miraculous. Since serious science has no place for miracles, these authors deem it eminently plausible to try to derive syntax, at any price, from some optimization criterion *of an extralinguistic nature*. One encounters skepticism, if not downright hostility, when one invites these authors to examine considerable amounts of data from many languages and ascertain the remarkable success that quite specific syntactic hypotheses have already achieved in explaining these data. The adaptationists choose to disregard these data, and the impressive success of linguistic theory, unwilling to concede that a line of inquiry based on generic optimization criteria of a nonlinguistic nature cannot offer the faintest hope of success.

6

It may seem strange to criticize “optimization” strategies in presenting a “minimalist” program for linguistic theory. It is not. The notions of strict economy and minimization that are so central to the theory expounded in this dialogue are not generic and extralinguistic. These are deep, novel, extremely elegant and powerful concepts, full of deductive and empirical consequences (many of which are yet to be explored), but they are nonetheless strictly language-specific. This point is examined in great detail and with many novel insights in the dialogue, but it may deserve some immediate clarification.

In light of the comments in section 5, it should be noted that generative grammar departs sharply from the traditional avenues into the study of language, both the naive ones (among which I recommend including many of those currently advanced in certain milieux of artificial intelligence) and the scholarly ones (notably including many structuralist ancestors). We have to travel back in time and reach the point where Chomsky’s approach to the study of language, ever since the mid-1950s, abruptly diverged from the long tradition that preceded it. In hindsight, it appears crucial to be able to share with him the commanding intuitions on *why* it was mandatory, and immensely productive, to single out a particular, in many ways unprecedented, level of analysis. In my experience, nonlinguists find it illuminating to learn that “meaning,” if taken in the traditional sense, plays a very unusual role in characterizing this level. And here it is unavoidable to consider examples, in the form of sentences.

Some sentence pairs impose themselves on us as naturally “belonging together,” others as (equally naturally) parting company:

- (1) a. They saw that he was trying to escape.
b. They saw him trying to escape.
- (2) a. They suspected that he was trying to escape.
b. *They suspected him trying to escape.

Plainly, to every fluent speaker of English, (1b) is very close (though not identical) in meaning to (1a), whereas (2b) is a most awkward rendition of a meaning similar to that expressed in (2a), and indeed sounds strange under any interpretation (whence the asterisk that precedes it). The important point is that this fact has much to do with “meaning,” but not in the usual sense. The similarity between (1a) and (1b), on the one hand, and the dissimilarity between (2a) and (2b), on the other, are somehow determined by the meanings of the verbs *see* and *suspect*: witness the fact that *suspect* is naturally followed by a sentence (*suspect that . . .*), whereas *see* is naturally followed by the name of an object (*see a cat*), though it also admits a metaphorical interpretation involving whole sentences, as in (1). The contrast between (1b) and (2b) teases apart these two interpretations. Yet it would be pointless to sit down and think very hard about the *concepts* of seeing and suspecting, or about the social “use” of these concepts in our everyday life, in order to derive an explanation for these simple facts. By straightforwardly substituting verb for verb in (1b), we realize that *see* belongs to a group of verbs in which we also find, for instance, *catch*, *find*, and *spot*. Similar substitution shows that *suspect* bands together with, for instance, *know*, *denounce*, and *dissuade*. Within each group, the verbs have very different meanings. There is no deep unifying feature among them, at a purely conceptual level. In other words, if we examine the kinds of physical or psychological actions that correspond to each of these verbs in the objective world, we find no criterion that allows us to explain the asymmetry between (1b) and (2b). We cannot even begin to find a suitable systematic explanation for such elementary facts by examining “concepts” in isolation, or by examining situations, beliefs, actions, or behaviors. The difference between the two groups of verbs lies primarily in their ability to combine with, and select, other elements in a sentence. The relevant difference, in other words, is syntactic, not conceptual.

It stands to reason that myriad facts like these may belong to a specific level of linguistic analysis, neither divorced from that of full-blown meanings and concepts, nor assimilable to it. It also stands to reason that we want the structural complexity of this level of linguistic analysis to remain constant as more detail is added, as sentences grow longer and more elaborate, as we nest subordinates into main sentences, as we form interrogative or dubitative expressions. Moreover, it is eminently desirable that the core structures turn out to be invariant across different languages.

We already have a first intimation that such a level must be built on criteria of simplicity and non-ad-hocness and that, to some extent at least, it must be seen as autonomous with respect to other levels also belonging to the general domain of thinking and communicating.

We can also summon evidence, again of a rather elementary nature, that this level (somehow) spans a range intermediate between that of single words and that of full sentences. Its constitutive rules, whatever they turn out to be, must be sensitive to the form of

words (i.e., to lexical morphology), but, once more, should not be assimilated to rules dealing purely with word forms. On the other hand, they are also, obviously, of a much finer grain than, say, a calculus based on the truth values of propositions as a whole and on their combinations by means of connectors (such as *and*, *or*, *if . . . then*).

For instance, we easily realize that deep commonalities in meaning exist between the expressions in (3),

- (3) a. I know the man who is standing at the bar.
- b. I know the man standing at the bar.

but that this is much less the case (or not at all, on one reading) in (4):

- (4) a. I found the man who was standing at the bar.
- b. I found the man standing at the bar.

Once more, we tease apart different possibilities of interpretation, we factor out different “valencies” for combination with, and selection of, other elements in sentences. When one explores the vast range of other similar cases, one finds it utterly implausible that an explanation could be based on the “concepts” involved (in this case, the “concepts” of knowing and finding). Generalizing the relevant data a bit, let us examine some deep commonalities among the following sentences:

- (5) a. He saw the man standing at the bar.
- b. The man was seen by him standing at the bar.
- c. Where was the man he saw standing?
- d. Who did he see standing at the bar?
- e. He failed to see the man standing at the bar.
- f. He succeeded in seeing the man standing at the bar.

The important intuition here (ever since Chomsky’s seminal work in the mid-1950s) is that in all of these expressions—and for the same reasons—*see* can be replaced with, say, *arrest*, but not with, say, *suspect* or *deny*. Notice that certain substitutions in fact preserve the interpretations and the roles, whereas others do not; and some may turn the sentence into nonsense, or even into gibberish. In spite of differences in word order, morphology (. . . *seeing*, . . . *to see*), and phrasal construction (active, passive, interrogative, subordinate, etc.), the rule that indifferently allows *see* and *arrest* in all these sentences, while disallowing *suspect* and *deny*, whatever it may be, applies uniformly. Therefore, no such rule can be stated in terms of the sequential ordering of the single words in the sentence—or in terms of infinitives versus gerunds, combinations of adjacent words, active versus passive, or anything of the sort. Traditional grammars, based as they are on the identification of characteristic “constructions” (such as passives and interrogatives) and the marking, as it were, of standard signposts in the sentence, prescribe piecemeal operations on words, or on fixed

groups of words located at certain positions. They are therefore by their very nature inadequate to cope with the basic facts exemplified here. A class of intrinsically more powerful grammars is needed, in which the relevant rules apply uniformly even though certain elements in the sentence have undergone movement (i.e., despite “transformations”).

This is a bare-bones reconstruction that I have found didactically expedient to suggest how Chomsky originally justified the need for a transition from “phrase structure grammars” to “transformational grammars.” In the second, but not in the first, words and constituents (noun phrases, verb phrases, etc.) can be “moved” from one location to another, leaving some essential grammatical relations invariant (who is doing the seeing and who is being seen, who is standing, etc.).

Plainly, as we have just seen, there is no hope of constructing the rules of such more powerful grammars either on the basis of “pure logic” or on the basis of a standard “conceptual” analysis. Even less can we hope to explain these facts on the basis of regularities pertaining to the world of motor control, sensory perception, communicative efficacy, or social conventions. Form and meaning are both involved, but in a highly specific, context-independent admixture. We do have intimations, in other words, of the specificity and the autonomy of syntax.

It might have turned out, in the abstract, that this level of linguistic analysis, and its constitutive idealizations, were contrived, “unnatural,” amorphous, arbitrary, and devoid of interesting crosslinguistic regularities. It might have turned out to be a haphazard “interface” of some sort. The all-important result has been that this level is, on the contrary, linguistically basic (one starts from here in explaining myriad linguistic facts), non-reducible (to extralinguistic considerations), autonomous (with respect to pragmatics and traditional semantics), and theoretically salient. It interacts systematically with other levels (notably morphology and lexical internal structures) in such a way that, so far, no other level of linguistic analysis has proven to be as productive as this one as the basis for a general theory of language, capturing profound commonalities across languages. Surely it does not constitute a mere “interface” between other levels.

Now, since the innermost organization of the mental faculty underlying this level cannot be adequately deduced only from truths of reason, and since it is not a consequence of generic design features for all viable symbolic systems of communication, it offers a unique and privileged window onto the nature of the human mind. This dialogue will in fact display a revealing picture of what has been learned so far about the human mind, and about the basic design of all human natural languages, by exploring, in great depth, this level and the mental computations that underlie it.

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In contrast with these heartening results, I cannot avoid at least a passing mention of a certain “disillusionment” with generative grammar that I sense these days in certain quarters of linguistics and of cognitive science more generally. The whole approach is seen by