

Semantic Structures

Ray Jackendoff

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For Noam, on whose shoulders it has
been a privilege to stand

Series Foreword

We are pleased to present this book as the eighteenth volume in the series Current Studies in Linguistics.

As we have defined it, the series will offer book-length studies in linguistics and neighboring fields that further the exploration of man's ability to manipulate symbols. It will pursue the same editorial goals as its companion journal, *Linguistic Inquiry*, and will complement it by providing a format for in-depth studies beyond the scope of the professional article.

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Samuel Jay Keyser

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Other versions of parts of this work have appeared elsewhere:

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"What Is a Concept, That a Person Can Grasp It?" *Mind and Language* 4.1/2 (1989)

Section 1.5

"X-Bar Semantics," in *Berkeley Linguistics Society: Proceedings of the Thirteenth Annual Meeting* (1987)

Chapters 2–4, section 7.1

"The Status of Thematic Relations in Linguistic Theory," *Linguistic Inquiry* 18.3 (1987)

Section 6.1

"Distributive Location," *Sophia Linguistica* 20/21 (1986)

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And, after all, there is Elise to thank for ongoing sanity.

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Introduction

The closing words of Chomsky's monograph *Syntactic Structures* are these:

...one result of the formal study of grammatical structure is that a syntactic framework is brought to light which can support semantic analysis. Description of meaning can profitably refer to this underlying syntactic framework, although systematic semantic considerations are apparently not helpful in determining it in the first place. The notion of "structural meaning" as opposed to "lexical meaning", however, appears to be quite suspect, and it is questionable that the grammatical devices available in language are used consistently enough so that meaning can be assigned to them directly. Nevertheless, we do find many important correlations, quite naturally, between syntactic structure and meaning; or, to put it differently, we find that the grammatical devices are used quite systematically. These correlations could form part of the subject matter for a more general theory of language concerned with syntax and semantics and their points of connection. (Chomsky 1957, 108)

To develop the "more general theory" that Chomsky envisions, one must confront two basic problems, which might be called the Problem of Meaning and the Problem of Correspondence. The Problem of Meaning is to characterize the phenomena that a theory of meaning is to account for, and to develop a formal treatment of semantic intuitions. In particular, a formal theory of meaning must be expressive enough to account for the distinctions of meaning made by language users, and for the semantic relations—including inference—that speakers can draw among words, phrases, and sentences. It must also provide the basis on which speakers relate words, phrases, and sentences to their understanding of the nonlinguistic world, so that they can make judgments of reference and truth.

The Problem of Correspondence is to characterize the relationship between the formal treatment of meaning and the formal structure of syntax. These two problems are clearly not entirely separate. One's choice of semantic formalism has an immediate effect on possible solutions to the Problem of Correspondence. Other things being equal, we should rate

more highly a solution to the Problem of Meaning that permits a more perspicuous solution to the Problem of Correspondence. On the other hand, one cannot work out a theory of meaning solely for the purpose of simplifying the Problem of Correspondence: there are many other boundary conditions that must simultaneously be satisfied.

The present study is an exploration of the interaction between these two problems. Much of my research over the past fifteen years has been concerned with laying the foundations of a theory of meaning called Conceptual Semantics, using first principles parallel to those that motivate generative syntax and phonology. *Semantics and Cognition (S&C)* and *Consciousness and the Computational Mind (C&CM)* situate the study of meaning in an overall psychological framework, integrating it not only with linguistic theory but also with the theories of perception, cognition, and conscious experience. However, for reasons of space and emphasis, these works did not expand the coverage of linguistic phenomena much beyond the analyses I had published in the early and middle 1970s. The time is now ripe to turn back to language and work out the consequences of Conceptual Semantics for a richer range of lexical items and syntactic constructions.

The book is organized into three parts. Part I begins with a précis of the relevant arguments in *S&C* and *C&CM*, setting out the basic parameters of the formalization of meaning and some general results. It then works out some fundamental aspects of the treatment of argument structure and thematic roles, in particular the present theory's counterpart of the θ -Criterion. It also deals with issues of lexical structure, including how the various syntactic frames in which a lexical item occurs are correlated with alternative meanings.

Part II is concerned with the Problem of Meaning—specifically, with extending the range of semantic fields encompassed by the Conceptual Semantics formalism. These chapters cover a miscellany of topics, chosen partly for their own intrinsic interest, and partly for their utility in dealing with phenomena to be addressed in part III, but also as illustration of the methodology by which one decides among alternative formalizations of meaning within the framework. It is shown that a number of new fields are profitably analyzed by adding features to existing conceptual primitives, rather than by introducing altogether new primitives. More significantly, it develops that meaning, like phonological structure, is organized into independent but interacting *tiers*, each of which contributes a different class of conceptual distinctions to meaning as a whole.

Part III deals with the Problem of Correspondence. The first three chapters address a wide range of adjunct constructions in English. The overall effect is to disrupt the rather tidy view of the syntax-semantics correspondence worked out in *S&C* and reviewed in part I: alongside the canonical

relations of syntactic to semantic arguments that are mediated by the head of a phrase, there prove to be numerous other strategies in the language for syntactically encoding thematic roles. In compensation for this additional complexity, though, it turns out to be possible to drastically simplify the argument structure specified by lexical items and to work out very general principles for the linking of complements to semantic argument positions; this is the topic of the final chapter.

In the passage quoted above, Chomsky rejects the assumption that syntax is totally determined by the structure of meaning, an assumption that underlies such otherwise divergent approaches as Montague Grammar and Langacker's (1986) Cognitive Grammar. To a certain extent, this assumption has also permeated contemporary Government-Binding (GB) Theory: despite a rather rudimentary conception of the semantic theory behind theta-roles, great reliance is increasingly placed on the θ -Criterion and the Projection Principle of Chomsky (1981)—and even Baker's (1988) more stringent Uniformity of Theta Assignment Hypothesis—for determining analyses of syntactic structure. With the more substantial understanding of semantic structure achieved here, we can better assess the extent to which the semantics determines or constrains the syntax. We also find areas where semantics rather naturally takes over some of the work normally attributed to syntax. The upshot is that the view taken by Chomsky in *Syntactic Structures* is in some ways closer to the truth than that in, say, *Aspects of the Theory of Syntax*: some parts of the semantics map fairly nicely into syntax—though still with all sorts of marked exceptions—but other parts of the semantics receive comparatively unsystematic syntactic realization. Thus a better articulation of semantic theory and its connections to syntax has significant repercussions for the autonomy of syntax.

Because this approach to the syntax-semantics connection is somewhat novel, certain very general questions arise frequently. Here are some of the more common ones.

"Aren't you introducing a lot of new machinery? How do you know it won't proliferate, unconstrained?"

I offer two lines of reply. First, there just are a lot of parts to meaning. Consider that perhaps a hundred thousand lexical items, each with a distinct meaning, must be projected into the five syntactic categories N, V, A, P, and Adv. I think it is therefore reasonable to expect a much richer formal system for semantics than for syntax.

Second, I consider the state of development of this theory to be comparable to the state of generative syntax in the early 1960s, say the time of Lees's *Grammar of English Nominalizations* and Klima's "Negation in English." As in that period in syntax, the emphasis at the moment is on descriptive power—tackling a wide range of phenomena, being able to state alternative solutions with some precision, and finding criteria to

decide among them. In the case of generative syntax, it was only through some years of experience in applying the formal machinery to a broad range of constructions that the issues bearing on the proper way of constraining the theory began to emerge. I believe that similar experience in semantic description is necessary before we can fully apprehend the right directions to pursue in constraining the theory. So, although I keep issues of explanation constantly in mind, they are for the moment somewhat secondary to formulating an interesting description of the phenomena. One can hope, however, that having the experience of syntax and phonology as a guide will help speed the process of finding the right questions to ask.

"How do you know your putative semantic primitives really are primitive? Mightn't there be an infinite regress?"

Again, there are two lines of reply. Of course we don't know in advance if we have reached bottom. However, every time a further decomposition emerges for elements previously thought to be primitive, it reveals further layers of generalization and explanation. For example, my previous work treated the notion of causation as a semantically primitive function CAUSE. Chapter 7, however, shows that this function decomposes into a pair of more primitive functions, each of which carries a number of features. In turn, these functions and features prove to run through broad swaths of the language, precisely as one would want in an explanatory theory.

Recall also the experience from everyone's favorite hard science, physics. The discovery of the periodic table of elements was one kind of decomposition of substances into primitives; but the atoms then turned out to decompose further into a nucleus and electrons, the nucleus decomposed into protons and neutrons, the protons and neutrons decomposed into quarks, and the quarks themselves are sets of features (spin, color, charm, etc.). Do the physicists worry about never hitting bottom? I don't know, but it doesn't stop them from trying to achieve further explanation.

"I'm a syntactician. Why should I get involved with all these strange semantic solutions? Besides, suppose the problems we're working on turn out to be purely syntactic after all—won't I have wasted my time?"

My reply to this is simple: You are perfectly free to pursue science according to your own taste. My feeling though, is that this strategy essentially amounts to looking for a lost coin under the streetlamp, because that's where we can see. The strategy I'm adopting here is to build more lamps.