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New Directions in Semantics

edited by

Ernest LePore

New Directions in Semantics

edited by

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For Donald and Marcia

Editors' Foreword

Cognitive science is the field of study marked off by the common concerns of artificial intelligence, linguistics, philosophy and psychology. The depth and richness of these mutual concerns suggests that certain issues may be essentially interdisciplinary. Nowhere is this clearer than at the intersection of cognition and language, where recent attempts to construct suitable formal theories have had to bring together different theoretical paradigms. The effect has been that the problems in one discipline have become those of another.

Cognitive science embraces a wide variety of topics, including parsing, discourse analysis, problem solving, language acquisition, concept formation, mental representation, semantics, cognitive modelling and visual processing. An interdisciplinary approach to these issues is committed to integrating, or perhaps synthesizing, relevant specialist theories with a view to revealing new horizons. The *Cognitive Science Series* aims to provide both a stimulus and a forum for relevant research. The intention is to encourage work which is either explicitly interdisciplinary or offers results likely to be of interdisciplinary interest. Since cognitive science is at an early stage of development, it is important to maintain the broadest possible perspective and hence, contributions to any aspect of the subject are invited.

Collections

To facilitate the growth of this multi-faceted subject the Series will include a 'Subseries' of collections devoted to issues of topical interest. Since these issues typically involve a wide spectrum of expertise, it is felt that volumes of selected papers may be particularly appropriate and useful. The Series will seek to publish such collections on a regular basis and would welcome proposals from prospective editors.

Monographs

As cognitive science matures, there will be an ever increasing need to meet the special concerns of the community. At the moment these concerns have yet to

take a definite shape, and it is hoped that the Series will in the meantime provide a focus for enquiry. Speculative monographs would be entirely appropriate, as would more empirical studies. In general the objective is to canvas broadly to allow the field to impose its character on the Series, thereby contributing to its definition.

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Introduction: New Directions in Semantics

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Recently, the field of semantic research has been characterized by the appearance of numerous new theoretical proposals. Each of these follows a different approach, but most have not been shown to be superior to, in competition with, or even distinct from the others. The problem here is that all of us who are professionally involved with the study of language are frequently faced with choices about what to read, what to teach, how to do research, and of course what to believe—choices which cannot be made intelligently without a clear understanding of the relationships, antagonistic or otherwise, between the various semantic theories. As a result, our choices are less informed, and probably more negative, than they used to be.

Given this situation, a systematic investigation of the interrelationships of the current semantic proposals seems clearly in order. To this end, I have divided the contemporary semantic scene into several somewhat rough and ready divisions, and have asked contributors, while acting as either spokesperson or critic, to answer as many of the following questions as possible: (1) What are the primary data for the semantic approach(es) your contribution investigates? To what extent and in what way do you think semantic accounts should involve describing, predicting or explaining this data? Is there only one correct semantic interpretation for each set of data? If so, what criteria do you use to decide among competing analyses? Do you distinguish between semantic competence and semantic performance? (2) Does the approach (or approaches) you consider involve statements

cast in some formal language? If so, is this formalism empirically significant? If not, is the approach in principle empirically unformalizable? (3) Which aspects of the approach are empirically falisifiable? What sort of empirical evidence is relevant? What would it take to increase the falsifiability of your approach? (4) Which of the claims made by the approach(es) you consider do you find the most significant and distinctive? What are the problem areas? Where does further research seem necessary? (5) How would you characterize the relationship of the approach(es) you most fully investigate to others? Which aspects make it (i) competitive with, (ii) superior to, (iii) inferior to, or (iv) combinable with these other approaches? It was my hope that each (or most of the) contributions would focus on one of a few prominent approaches to semantics for natural language, but would include as much discussion as possible of the nature of its disagreements and points of contact with others. I believe that a careful reading of the articles which follow will bear out that this goal has been successfully met in this volume. This sort of comparative evaluation of semantic theories should channel research in fruitful directions and increase collaboration between scholars in philosophy, psychology, linguistics, computer science and cognitive science. I believe that the articles which follow are a step toward that goal. Informed choices are not based solely on presentations of problems and proposed solutions for them, but instead on critical evaluations of these proposals as well. Many of the articles which follow are intended to serve this purpose alone. The reader cannot complain at a lack of critical commentary.

I wish to thank Academic Press for their patience and help in putting this volume together. I also would like to thank Barry Richards and Francesca Bertelli for their help. Loretta Mazlen Mandel, who continues to be the best of all imaginable assistants, I cannot thank enough.

Ernest LePore
Rutgers University

Contents

Contributors v
Editor's Foreword ix
Acknowledgements x

Introduction xi
E. LePore

Chapter 1: On Semantics 1
J. Higginbotham

Chapter 2: (Nonsolipsistic) Conceptual Role Semantics 55
G. Harman

Chapter 3: Dual Aspect Semantics 83
E. LePore and B. Loewer

Chapter 4: Existentionalist Semantics and Sententialist Theories of Belief 113
S. Schiffer

Chapter 5: Semantic Competence and Truth-Conditions 143
W. G. Lycan

Chapter 6: Common Sense in Semantics 157
J. J. Katz

Chapter 7: Game-Theoretical Semantics as a Synthesis of Verificationist and Truth-Conditional Meaning Theories 235
J. Hintikka

Chapter 8: In Defense of Semantic Fields 259

R. Grandy

Chapter 9: Justification of Speech, Acts and Speech Acts 281

A. Kasher

Chapter 10: Logical form as a Level of Linguistic Representation 305

R. May

Chapter 11: Tenses, Temporal Quantifiers and Semantic Innocence 337

B. Richards

Chapter 12: Problems in the Representation of the Logical Form of Generics, Plurals, and Mass Nouns 385

L. K. Schubert and F. J. Pelletier

Chapter 13: The Meaning of Truth 453

A. Gupta

Index 481

1

On Semantics

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In this article I will formulate and partly develop one conception of semantic inquiry in generative linguistics. In conjunction with specific applications, I will address questions about domains of investigation, the data in those domains that ought to be accounted for, and their characteristic forms of explanation. Much of the semantic discussion will require syntactic assumptions that are not defended here. However, I believe that these assumptions are not the only ones out of which the general point of view would emerge.

DATA AND EXPLANATIONS

If it is an aim of linguistic theory to characterize those systems of human linguistic knowledge that result from native endowment and the ambient environment, then semantic theory, as a chapter of linguistics, will be concerned with those aspects of meaning that emerge in the course of normal maturation of the faculty for language. These aspects will be independent of context; that is, they will be determined by the design features of human language, and not by the way language is put to use. Perhaps nothing at all that people say has its meaning wholly independently of context. It does not follow that semantic theory has little to say, or that

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it is in any way intrinsically incomplete. On the contrary, it is only through the context-independent features of meaning that we know what aspects of a context to take as relevant in the first place to the interpretation of the utterances around us.

Theoretical questions arise in linguistics whenever we find a realm where we know far more than we are taught. By this standard, as Hornstein (1984) emphasizes, the semantics of complex expressions raises questions of the same type as those that occur in phonology and in syntax. Very likely the same considerations apply also to lexical semantics, in the sense that the appearance of a word in a restricted number of settings suffices to determine its position in the language as a whole. My first concern here will be to make some of these questions of semantics explicit.

In much the same way as the data for syntax include observations about sentencehood and those of morphology include the pronunciation and significantly recurring features of complex words, the data for semantics certainly include observations about the meanings of sentences. These are obvious facts about what things mean, known to native speakers, that an adequate semantic theory must have among its consequences. As Donald Davidson especially has emphasized, the *disquotational* truths—that is, statements like (1)—are already a rich source of material (Davidson, 1978, 1984):

(1) *John saw Mary* means that John saw Mary.

They set a fundamental semantic problem, namely that of showing how a string of words under a grammatical description constitutes a sentence with a definite meaning. Of course, Davidson ultimately believes that statements like (1) are best replaced for theoretical purposes by what we might call *directives* for theory construction, and specifically for the construction of a theory of truth. The directive corresponding to (1) would be (2):

(2) Make your theory such that it is provable that:
John saw Mary is true if and only if John saw Mary.

I will follow Davidson in this view. However, I will freely use simple statements like (1) in discussion. Application of the theory to (1) itself, and particularly to the question of the semantic status of the *that*-clause, might proceed as in Higginbotham (1984a).

Directives like (2) are assumed for expressions of other categories than that of declarative sentences, with the notions appropriate for those categories used in place of that of truth. It will be part of semantic theory, for example, to show both that the expression *Mary's mother* refers to Mary's mother (if it refers to anything) and how the individual words, and their

specific mode of combination, bring this about. The theory of the context-independent aspects of truth and reference, flowing from the interpretation of the combinatorial devices of language, forms a significant chapter of semantics. The categories of expressions that have meaning are not limited to the single category of sentences.

In generative syntax, as formulated in Chomsky (1957), one addresses the problem of explicitly defining, for given natural languages *L*, the notion 'sentence of *L*.' The native speaker of *L* knows what the sentences of *L* are; the linguist, if successful, reveals something of the nature of the native speaker's knowledge, by constructing a *grammar* of *L*. Of the first significance in this enterprise is that a datum to the effect that something is *not* a sentence constrains grammar equally with a datum to the effect that something *is* a sentence. Similarly, I think, the data of semantics should be seen in both their positive and their negative aspects: for any given expression, that it *does* mean *X*, or *can* mean *X*, and that it *does not* mean *Y*, or *cannot* mean *Y*, are facts to be deduced in semantic theory. A standard picture of a language as a syntax and semantics, for example as outlined in Lewis (1975), contains both of these aspects. Sentences or their structural descriptions are paired with meanings, or with ranges of meaning, so that what is excluded from the range of meaning of a sentence comprises those things that it does not mean (Lewis, 1975, p. 3). However, I think that something is missing from Lewis's picture, which I will endeavor to bring out by example.

Consider the facts in (3):

(3 a) *The men told the women to vote for each other* can mean that the men told each of women to vote for the other woman.
(b) *The men told the women to vote for each other* cannot mean that each of the men told the women to vote for the other man.
(c) *The men told the women to vote for each other* cannot mean that each of the men told the women he would vote for the other man.

(3a–c) should all be deduced in semantic theory. Let us consider how these deductions might be carried out.

In the syntactic framework assumed here, roughly following the lines of Chomsky (1981), linguistic objects are represented at the four distinct levels of *D-Structure, S-Structure, Phonetic Form* (PF), and *Logical Form* (LF). Whatever the nature of LF, it is supposed that all grammatically determined information that is relevant to interpretation is to be found there. The levels of S-Structure and LF, where understood elements are explicitly represented, will chiefly occupy us (for the following discussion, we need not distinguish S-Structure from LF). The S-Structure representation of

the sentence in question is as shown in (4):

(4) [[the men] told [the women][PRO to vote for [each other]]]

If in this structure we assign antecedence as in (5) (following the method of Higginbotham (1983a)),

(5) [[the men] told [the women][PRO to vote for [each other]]]

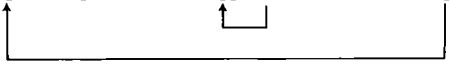
then it is up to semantic theory to show that (5) means that the men told each of the women to vote for the other woman. Demonstration of this proposition falls naturally into two parts: first, the account of the structures (6),

(6) NP told NP [(that) S][1]

and second, the account of the anaphoric relations shown (see below, and Higginbotham (1984a), for a sketch). The datum (3a) will then follow.

How is (3b) to be deduced? Our account proceeds in this way. First, the structure (7) is ungrammatical in English:

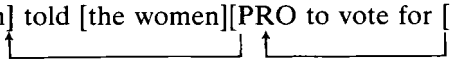
(7) [[the men] told [the women][PRO to vote for [each other]]]



The anaphor, a direct object of the lower clause, does not have its antecedent within that clause. But (7) is the structure that would have to be assigned to the sentence, were it to mean that each of the men told the women to vote for the other man. Therefore, (3b) follows.

Semantic theory applies to (7) exactly as it applies to (5). In a language with 'long-distance' reciprocals, there would be a *grammatical* structure like (7), expressing precisely the meaning that the English sentence would be able to express if (7) were not ungrammatical. Similarly, in a language for which the understood subject PRO of the embedded clause could be related to the subject NP *the men,* as in (8) (ungrammatical in English),

(8) [[the men] told [the women][PRO to vote for [each other]]]



the word-for-word translation of *The men told the women to vote for each other* could mean that each man told the women he would vote for the other man, which the English sentence cannot; the ungrammaticality of (8) is the basis for (3c).

Here, then, is what I think is missing from Lewis's picture. In that picture, sentences have various ranges of meaning, and some are meaningless, but nonsentences do not have any meanings. However, the last statement is false to natural languages: nonsentences must have definite meanings, as full-blooded as those of ordinary sentences, if the source of their intuitive uninterpretability (or merely partial interpretability) is just the violation of a rule of formal grammar.

In Higginbotham (1984a) I suggested that it was a misperception of the relation between syntax and semantics to suppose that syntax is simply the theory of well-formedness, and semantics, taking the results of syntax as given, the theory of the meanings of well-formed expressions. That expressions that are well-formed can have definite interpretations was illustrated by the example (9), cited in Davidson:

(9) The child seems sleeping.

This and similar examples already suffice to show that a theory of meaning that limits itself to the well-formed expressions cannot be correct. However, the thesis just advanced about (3) has still stronger implications.

If we enlarge the realm of semantic inquiry beyond the piecemeal discussion of individual languages, to raise the epistemological question of the acquisition of language by human children under normal conditions, then we shall, I believe, be led to construct semantic theory for human language in such a way that a variety of expressions that do not, by ordinary standards, 'mean anything' are seen to have fixed interpretations, deducible from general principles that connect form and meaning. The reasons for this are twofold. First, there is the variety of meaning that results in different languages from replacing words one-to-one with their translations; and second, the most fundamental principles of semantics are so remote from the data available to the child (situations of utterance, the behavior of other speakers, etc.) that it is quite plausible to suppose that these principles vary minimally or not at all from language to language, the differences that show up being attributable to local syntactic conditions.

Our discussion of (3c) already illustrates the point. The Italian sentence (10)

(10)	Gli uomini	dissero	alle donne		di votare	gli uni	per gli	altri.
	the men	told	(to) the women		to vote	the one (man)	for the	other

does indeed mean that each of the men told the women that he would vote for the other man (thanks to Alessandra Giorgi for the example, and for discussion). The reason is that the understood subject PRO in the Italian sentence can be controlled by the matrix subject *gli uomini* (as is clear from other examples). Thus, antecedence is assigned as in (11), where locality