

index to locate a reference. It may not find a well-defined readership but it gathers so much useful and interesting information in one place that it is well worth having if the reader is prepared to deal with the deficiencies mentioned above.

*Richard S. Rosenberg* has research interests in artificial intelligence, including natural language understanding, interfaces to data bases, and language pragmatics. In addition, he is concerned with social issues and is the author of *Computers and the Information Society* (John Wiley). His address is: Department of Computer Science, University of British Columbia, Vancouver, BC, Canada V6T 1W5.

---

## REMNANTS OF MEANING

**Stephen Schiffer**

(University of Arizona)

Cambridge, MA: The MIT Press / Bradford Books,  
1987, xx + 303 pp.  
ISBN 0-262-19258-6, \$27.50 (hb)

*Reviewed by*  
*Morena Danieli*  
*Olivetti*

Schiffer's book is a devastating critique of analytical philosophy of language. The author aims at undermining the philosopher's confidence in the facts about language and thought that are usually taken as uncontroversial starting points. Schiffer argues that the questions that now define philosophy of language have false presuppositions and that the most prominent philosophical theories related to those questions are hopeless endeavors.

In the past years Schiffer was much taken with Grice's program, i.e., with the idea of "reducing the semantic to the psychological by first defining speaker-meaning in terms of certain species of semantical behaviour whose specification did not itself involve anything semantical, and then defining expression-meaning in terms of the reduced notion of speaker-meaning" (p. *xiii*). Now Schiffer says that this program of **intention-based semantics** (IBS) is impossible to implement for it is impossible to account for the content of beliefs in a language-independent way and to state propositional-attitude facts in sentences devoid of mentalistic idioms. In trying to deal with such negative conclusions, Schiffer came to forsake a great amount of what most philosophers of language still accept, and was drawn to the conclusion that such hypotheses as the existence of semantic facts and compositionality of meaning are misleading. The book is therapeutic rather than constructive: it belongs to the trend beginning with Wittgenstein's *Philosophical Investigations* (1953), and continued, more recently, by Richard Rorty's *Philosophy and the Mirror of Nature* (1979). It doesn't propose a new theory of meaning, but it puts the analytical phi-

losophers in a critical position by attacking their professional role and their conceptual schemes.

I think that this book will be interesting even for people approaching it from an AI or computational linguistics perspective, for many of the philosophical topics discussed here can't be ignored by computational linguists concerned with semantic interpretation: e.g., analysis of belief and modal sentences, recognition of speaker's intentions, and compositionality of natural languages. I can't discuss all of them here, so I'll concentrate on the last one, which according to me should be a central issue for any theory of natural language understanding (NLU). Schiffer's idea that the semantics of natural language is not compositional is hard to accept, for it seems too tied to his refusal of IBS. Nevertheless, I think that his view can offer us some positive insights. Until now, research in NLU has been notably successful mainly in the area of syntax. The analysis of the meanings of the words has no firm foundation in the works of the computational community: most of the computational semantic analysis is still close to the procedural paradigm of the late '60s. Recently Graeme Hirst (1987) stressed this situation and pointed out that compositionality should be an important desideratum for a theory claiming to provide such foundations.

Compositionality is the principle according to which the semantic value of a sentence depends on those of its parts. Within philosophy of language it is known as **Frege's Principle**, and is regarded as an adequacy criterion for semantic theories of natural languages. It is not surprising, therefore, that Schiffer's attempt to undermine the theoretical basis of the philosophy of language also involves the rejection of the compositionality principle. More precisely, Schiffer comes to deny "the reason for supposing that natural languages have compositional semantics" (p. *xvi*), after having argued that the relational theory of propositional attitude is false. In fact, Schiffer says:

On the one hand, it would appear that if, as many suppose, natural languages have compositional, truth-theoretic semantics, then the relational theory of propositional attitudes must be correct; while, on the other hand, I have argued that the relational theory is false. I must therefore deny that the relational construal of "believes" is required by its accommodation within a compositional semantics, or else deny that natural languages have compositional semantics. I opt for the latter course. (p. *xviii*)

Schiffer's position seems to be close to the widely held opinion that compositionality is unmaintainable if one denies the relational thesis on propositional attitudes. But he also seems to argue for a more substantial thesis, i.e., for the idea that compositionality is not a feature of natural language semantics. Schiffer admits that compositionality might seem a good way to account for the ability of native speakers to understand utterances of novel sentences:

It may seem obvious that one understands the utterance of a novel sentence because one knows the meanings of the words contained in it and, in some sense, knows a rule for determining the meaning of the sentence on the basis of its syntax and the meanings of its words. (p. 179)

Nevertheless, he argues that the evidence for a compositional truth-theoretic semantics is pretty glib, because one can give a correct model of language understanding and productivity without assuming a compositional truth-theoretic semantics.

In the seventh chapter of the book he suggests a counterexample to the compositional view about language understanding. He describes a possible world in which a human computer, Harvey, understands a language *E*, as complex as English. The author analyzes Harvey's comprehension of some sentences and he draws a picture in which heuristic tools, such as the 'conceptual roles' of some expressions of Harvey's neural language of thought, allow him to show that "there could be a correct psychological model of a person's language processing that does not presuppose a compositional semantics for the mastered language" (p. 205).

But one might object that if compositional semantics is not needed in order to account for language understanding, it is needed in order to explain what Schiffer calls "the platitude", i.e., the idea that the meanings of sentences are determined by their syntax and the meanings of their words. In Chapter 8, Schiffer argues against this objection by introducing other heuristic notions, such as the "saying-potential" and the "processing role" of linguistic expression. In the sentence "Michel believes that his car was stolen", the word "believes" has a processing role that determines its saying potential each time the word is used. "Believes" is a semantic primitive, "but it is not a semantic primitive in any sense appropriate to a compositional semantics, for no base axiom, no satisfaction clause, can be written for 'believes' that could take its place in a true truth theory for English" (p. 216).

Schiffer does not want to deny all the aspects of semantic compositionality, nor that natural languages contain truth-affecting iterative devices (p. 208). What he denies is the relevance of truth-theoretic semantics to an account of language understanding and productivity. He denies that something like analytic philosophy is possible, but in the meantime he suggests that the compositionality of natural language should be explained via cognitive models of linguistic behaviour. At the very end of his book, he seems to set up an alliance with cognitive science in order to explain facts about language which do need explanation. They are facts about language comprehension, about the ways in which we store, represent, and process information. But, Schiffer says, these "are not philosophical questions (although the skills of the philosopher would be relevant to answering them)" (p. 271).

## REFERENCES

- Hirst, Graeme 1987 *Semantic Interpretation and the Resolution of Ambiguity*, Cambridge University Press, Cambridge, England.  
 Rorty, R. 1979 *Philosophy and the Mirror of Nature*, Princeton University Press, Princeton, NJ.  
 Wittgenstein, L. 1953 *Philosophische Untersuchungen [Philosophical Investigations]*, Basil Blackwell, Oxford, England.

*Morena Danieli's* thesis was on the semantics of proper names. Her present interests concern the integration of syntax and semantics in natural languages. At Olivetti, her research concerns the development of syntactic tools for language analysis. Danieli's address is: Speech and Language Laboratory, Olivetti, c.so Svizzera 185, 10149 Torino, Italy.

## MACHINE TRANSLATION TODAY: THE STATE OF THE ART (PROCEEDINGS OF THE THIRD LUGANO TUTORIAL, APRIL 1984)

Margaret King (ed.)

(Institute for Semantic and Cognitive Studies,  
University of Geneva, Switzerland)

Edinburgh University Press, 1987, xii + 447 pp.  
 (Edinburgh Information Technology Series 2)  
 ISBN 0-85224-519-X, £45.00 (hb)

Reviewed by

John Hutchins

University of East Anglia

It is always regrettable when the proceedings of conferences appear a long time after they were held, in this case nearly four years, but it is even more so in a rapidly changing field such as machine translation (MT). Developments since this MT tutorial was organized by the Dalle Molle Institute for Semantic and Cognitive Studies (ISSCO) in early 1984 mean that many of the contributions have now predominantly historical interest. They are, however, no less valuable since many are accounts of MT systems which have not been bettered in comprehensiveness before or since. In keeping with its historical character and its originally-intended role as a general introduction to the state of the art in MT, the volume contains a mixture of historical surveys, discussions of linguistic and computational problems, and detailed descriptions of major systems. It does not include papers on practical implementations of MT systems, on comparative evaluations of MT output, or on the impact of MT on the translation industry. Some readers may regret their absence but the value of the collection lies precisely in its emphasis on the linguistic features of MT systems, and on the more theoretical aspects of MT research. Contributions have been divided into three sections: Part 1, containing essentially background papers; Part 2, devoted mainly to software; and Part 3, to accounts of particular MT systems.

Part 1 opens with two general historical overviews by Beat Buchmann covering MT history until the notorious ALPAC report in 1966, and by Susan Warwick on developments since 1966. Although necessarily brief,