

ELEMENTS OF MATHEMATICAL LINGUISTICS

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A.V. Gladkij and I.A. Mel'čuk

edited by John Lehrberger

Mouton Publishers

Berlin, New York, Amsterdam, 1983

Pp. xxi, 247. ISBN 90-279-3118-6

1983, P. vii, 90.

Most of this book (the first 148 pages) is an English version of an introduction to mathematical linguistics originally published in Russian in 1969. This material has been expanded into a more standard-sized book for the English-speaking market by tacking on three articles on special topics in mathematical linguistics published elsewhere by one or both co-authors; but each of these articles is already available in English translation, and the book stands or falls by the usefulness of its first part.

When Gladkij and Mel'čuk wrote their book in the late 1960s, mathematical linguistics was little known, even in the USA where most of it had been created not long before. I guess that it was a fairly remarkable achievement on their part to discover and master this exotic discipline (and, in Gladkij's case, to make a number of original contributions to it), and then to make it known to their fellow-countrymen.

However, whether it makes good sense to bring out an English version of the book in the 1980s is a different matter. I must say that I feel the answer is no, for many reasons.

In the first place, mathematical linguistics has moved on since the 1960s. Gladkij and Mel'čuk's book deals almost exclusively with the hierarchy of types of language, defined in terms of types of grammar (unrestricted rewrite systems, context-sensitive grammars, context-free grammars, one-sided linear grammars), with a small amount on the relationship with types of automata, on decidability theorems, and a few other matters. The topic of parsing – and mathematical formalisms with

special relevance for automatic language processing, such as the ATN – are not mentioned. In 1969, one would not have expected them to be; in the 1980s, these are surely indispensable components even in an introduction to "mathematical" (as opposed to "computational") linguistics. Gladkij and Mel'čuk are quite explicit about the fact that they have made no attempt to bring the book up to date: "The manuscript of the Russian version of this book was completed in 1967 and we are not in a position to revise it now. . . . Even a mere list of references would be out of the question."

Secondly, the book relies heavily on Russian-language examples which are lost on an English reader. Thus, early chapters largely revolve round a largish formal grammar produced by the authors in order to generate the complex range of Russian participles. It must have been a significant virtue of the original book that it demonstrated how the concepts of mathematical linguistics could be made to achieve a novel task relating specifically to the readers' own language, but for a British or American student the result is that ideas many people find difficult at the best of times are rendered wholly opaque.

And, finally, Gladkij and Mel'čuk just are not very good at writing for an unknowledgeable audience. They make their formal rules notationally much more complex and exotic-looking than they need be – to a fellow mathematician, a trivial matter, but for an unconfident student very unfortunate. On page 25 they use the term *monoid* without, I think, ever explaining what it means (there is no index, so it is hard to check); on page 81 they use a technical term of their own which is first defined on page 122.

The fact is that there are now enough English-language books that do the same job as this book and do it much better.

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**AUTOMATIC SEMANTIC INTERPRETATION:
A COMPUTER MODEL OF UNDERSTANDING
NATURAL LANGUAGE**

Jan van Bakel

Foris Publications

Dordrecht, Holland, 1984

Pp. x, 176, \$14.40, Dfl. 36.00

ISBN 90-6765-039-0

"Semantic interpretation" is an expression that seems to mean something different to everyone who uses it. What it means to van Bakel is translation from a Dutch surface form into a case-like structure, which is expressed in a language called SELANCA. The interpretation retains the

content words but not the structure of the input; that is, it is not an expression in an interlingua or knowledge representation that is independent of the source language.

Van Bakel takes view of both language and linguistics counter to those currently prevailing in North America (I don't know about Europe or elsewhere). First, he rejects any connection between theoretical linguistics and computational linguistics, seeing the former as no longer having anything to say to the latter, which may now proceed solely as an application-oriented enterprise. Second, in contrast to the situation semantics view à la Barwise and Perry (1983), van Bakel sees reality as being structure or constrained by language rather than the other way round. "The reality which is related to [a