

**COMMUNICATING WITH DATABASES IN NATURAL LANGUAGE**

(Ellis Horwood series in artificial intelligence)

Mark Wallace

Chichester: Ellis Horwood, 1984, 170 pp.  
ISBN 0-85312-639-9; \$29.95  
[Also distributed by Halsted Press/John Wiley & Sons as ISBN 0-470-20105-3]

As a programming language for computational linguistics, Prolog is a relative newcomer. Mark Wallace, however, demonstrates very clearly in this timely book the value of this important tool, especially as it relates to the building of natural language front ends and interfaces to database systems. He takes a very practical approach which should appeal to anyone who has had to contend with the difficulties of designing and implementing natural language interfaces.

Wallace begins by providing some background on natural language interfaces. He surveys most of the conceptual issues, but generously intersperses concrete references to major research papers and projects. Some might find his survey too shallow and broad in certain respects, but I personally found his treatment fair and complete.

In subsequent chapters, Wallace introduces a formal query language, called **D&Qs**, based on referring phrases (Descriptions) and qualifying phrases (Qualifiers). He then uses this formalism as a representational vehicle in the development and Prolog implementation of a natural language interface, called **QPROC**. D&Qs is based on predicate calculus, suitably restricted to provide an adequate relational query language. Queries in D&Qs can either be cast into Prolog (as in his "pilot" version) or converted by Prolog to an underlying query language. In the Prolog version, each simple qualifier is handled through facts, each relation maps into a predicate, and each tuple of the relation ends up as a Prolog clause for that predicate.

Although the parser is treated in a domain-independent fashion, semantics adopts a fairly conventional relation and attribute style, with verbs, of course, playing the major roles. Some major issues of semantics are clearly identified for the reader, including ambiguity, several matters involving reference and qualification, and ways to handle the verb *to be*.

The reader should not, however, view this book as something it does not claim to be – namely, a book that provides a thorough and adequate introduction to the areas of database systems, natural language understanding, or Prolog (although the latter is discussed at some length in an appendix). Such readers will be disappointed. A moderate level of competence in these areas is certainly assumed. The interested reader should find the extensive bibliography also very useful.

I recommend this book to those who feel competent with Prolog, have a basic understanding of relational database systems, and can reason through a modest amount of predicate calculus.

Stan C. Kwasny  
Department of Computer Science  
Indiana University  
Bloomington, IN 47405

**THE MENTAL REPRESENTATION OF GRAMMATICAL RELATIONS**

(MIT Press series on cognitive theory and mental representation)

Joan Bresnan, Editor

Cambridge: The MIT Press, 1983, lii+874 pp.  
ISBN 0-262-02158-7, \$35.00

**LEXICAL-FUNCTIONAL GRAMMAR**  
(Trends in linguistics, Studies and monographs 21)

George M. Horn

Berlin: Mouton Publishers, 1983, 394 pp.  
ISBN 90-279-3169-0

One of the curiosities of practical linguistics has long been the chasm between linguistics, as practiced by, for example, computational linguists, and linguistic theory. Lexical-functional grammar deserves some attention from the practical linguist if only because it contains an explicit attempt to bridge this chasm.

Lexical-functional grammar is firmly planted in Chomskyan tradition. It builds on all the accepted conclusions of that theory through X-bar theory. Bresnan began lexical-functional grammar in a 1978 publication, and she has continued it since then in a number of publications. *The Mental Representation of Grammatical Relations* brings together this work and the work of a number of collaborators into a synthesis that includes many interesting innovations. *Lexical-Functional Grammar* is an individual work that is not "orthodox", in the sense that it deviates from Bresnan's own theory in some non-trivial ways. In this review, I will concentrate on Bresnan's theory and discuss Horn's contributions only in passing.

I will begin by trying to describe lexical-functional grammar for the outsider. It will be necessary to squeeze a lot into a few sentences, but the reader needs to understand some of the machinery (for instance, the striking up-arrow and down-arrow notation) to understand anything about the theory.

Grammar is divided into several modules that function independently of one another to process an utterance out of the mind into speech, or in the other direction. Theoreticians like to ignore the production of sentences and move directly to a module, having no generally