

value to be a set of functions rather than just one. This is a rather transparent trick to avoid saying that "adjunct" occurs several times as an argument and the set of ordered pairs is not, in fact, a function. Either we have to do with something we might call a "near-function", or we have to reformulate the well-formedness rules.

Both of the books being reviewed are mainly devoted to proving that this framework does not fall apart when presented with certain standard problems. Horn's book is less rigorous and closer to conventional linguistic theory. The main difference in the two theories seems to be that Horn admits function predicates (that is, values of the argument "predicate") that are themselves functions rather than atomic logical predicates. This is interesting from the mental representation point of view and deserves more discussion from that point of view than it gets in either book.

Bresnan has collected a number of very competent co-workers, most notably Ronald M. Kaplan, and *Mental Representation* is a collection of different contributions with a rather thin thread of continuity. Bresnan is the author or co-author of six of the thirteen chapters. The material is not restricted to English, and there are chapters on French, Russian, Icelandic, and Malayalam. All of the work is intended to prove applicability of the theory, rather than present the results of complete implementations.

Part III of *Mental Representation* is entitled "Cognitive Processing of Grammatical Representations"; it contains three chapters. "A Theory of the Acquisition of Lexical Interpretive Grammars" by Steven Pinker discusses acquisition by children. This reviewer admits to no longer being able to understand articles in this increasingly specialized sub-field of linguistics. "A Competence-Based Theory of Syntactic Closure" by Marilyn Ford, Bresnan, and Kaplan is, to a computationally-oriented linguist, the high point of the book. It contains a theory, supported by experimental evidence, of how real people analyze real utterances; and it ends up with a perfectly feasible plan for computerization (in terms of Kaplan's (1981) General Syntactic Processor) of lexical-functional grammars. "Sentence Planning Units: Implications for the Speaker's Representation of Meaningful Relations Underlying Sentences" by Ford discusses production of utterances and presents some valuable experimental data.

It is not possible, of course, in a review to do anything like justice to the wealth of detail in either of these books. For example, Horn systematically compares his English analysis with a parallel analysis of Polish. In fact, all of the authors wrestle with the problem of free word order and seem to achieve victories. In a chapter on "Control and Complementation", Bresnan tackles word order and even worse problems with some success. The language-specific chapters contain much of value that cannot be discussed here; and so on.

Lexical-functional grammar appears to be flourishing, but it has not swept away all the other schools of thought. Still other alternatives can be visualized. For example, we might question the asymmetry between phonology and semantics, and change the model to place them on a common basis. We might use phrase structure and lexicon to generate something called "deep structure" and two sets of descriptions, one on each side, to be solved.

Horn tries to formulate the construction of functional structures with something very like transformations rather than the arrow formalism. It is true, in an empty way, that every mapping of this kind is a transformation. But the process of solving the description wrecks havoc with conventional simplicity metrics. It is not, of course, fashionable any longer to mention simplicity metrics, but a glance at the argumentation procedures of any theoretical linguist will disclose that they are alive and well, if never acknowledged. Theoretical linguists choose, continually, between models on the basis of what mathematicians call elegance. This is unobjectionable because it is simply another version of Occam's Razor; but mathematicians live in a world where anything, notationally speaking, goes. Linguists have been, generally speaking, captive to their notational devices. It may well be that the most valuable contribution of lexical-functional grammar is to introduce the implicit function theorem into linguistics.

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References

- Bresnan, J. 1978 A realistic transformational grammar. In Halle, M., Bresnan, J., and Miller, G.A., Eds., *Linguistic Theory and Psychological Reality*. Cambridge, Massachusetts: The MIT Press.
Kaplan, R.M. 1981 Active chart parsing. Xerox Palo Alto Research Center.

BOOKS RECEIVED

The following books have been received.

Data Bases in the Humanities and Social Sciences 2
(Papers from the 1983 International Conference on Data Bases in the Humanities and Social Sciences)

Robert F. Allen

Osprey, Florida: Paradigm Press, 1985, 434 pp. [ISBN 0-931351-006 (paper) \$41; (cloth) \$64]

Language Sound Structure: Studies in Phonology Presented to Morris Halle by his Teacher and Students

Mark Aronoff and Richard T. Oehrle with Frances Kelley and Bonnie Stephens Wilker (Editors)

The MIT Press, 1984 [\$35.00]

Rationality and Intelligence

Jonathan Baron

Cambridge University Press, 1985, viii+299 pp. [ISBN 0-521-26717-X, \$32.50]

*Knowing Who***Stephen E. Boër and William G. Lycan**

Cambridge, Massachusetts: The MIT Press / Bradford Books, 1986, xiv+212 pp. [ISBN 0-262-02228-1; \$22.50]

Mass Terms and Model-Theoretic Semantics

(Cambridge studies in linguistics 42)

Harry C. Bunt

Cambridge University Press, 1985, xiii+325 pp [ISBN 0-521-25681-X; \$49.50]

*Computers in Linguistics***Christopher S. Butler**

Oxford: Basil Blackwell, 1985, ix+266 pp. [ISBN 0-631-14267-3; £19.95]

*Computer speech processing***Frank Fallside and William A. Woods (Editors)**

London: Prentice-Hall International, 1985, xxi+506 pp. [ISBN 0-13-163841-6]

*Theoretical Aspects of Reasoning about Knowledge:**Proceedings of the 1986 Conference***Joseph Y. Halpern (Editor)**

Los Altos, California: Morgan Kaufmann Publishers, 1986, vii+407 pp. [ISBN 0-934613-04-4 (pbk); \$18.95]

Artificial Intelligence and Psychiatry

(The scientific basis of psychiatry 1)

D. J. Hand

Cambridge University Press, 1985, x+266 pp. [ISBN 0-251-25871-5; \$39.50]

*A Cognitive Theory of Metaphor***Earl R. Mac Cormac**

Cambridge, Massachusetts: Bradford Books / The MIT Press, 1985, x+254 pp. [ISBN 0-262-13212-5; \$22.50]

*Syntactic Tree Structures in DLT***Klaus Schubert**

Utrecht: Buro voor Systeemontwikkeling, 1986, 211 pp. [ISBN 90-70730-022]

*The Psychology of Literacy***Sylvia Scribner and Michael Cole**

Cambridge, Massachusetts: Harvard University Press, 1981, xiii+335 pp. [ISBN 0-674-72114-4 (paper) \$10.95; 0-674-72115-2 (cloth) \$25.00]

Introduction to the Theory of Grammar

(Current studies in linguistics 12)

Henk C. van Riemsdijk and Edwin Williams

Cambridge, Massachusetts: The MIT Press, 1986, xvi+366 pp. [ISBN 0-262-22028-8 (cloth) \$35.00; ISBN 0-262-72009-4 (paper) \$17.50]

*Understanding Computers and Cognition: A New Foundation for Design***Terry Winograd and Fernando Flores**

Norwood, New Jersey: Ablex Publishing Corporation, 1986, xiv+207 pp, [ISBN 0-89391-050-3]

Readers who wish to review books for **Computational Linguistics** should write, giving their qualifications and their sub-fields of interest and expertise, to the book review editor,

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