

model of systemic grammar (to my knowledge the only such formal model extant today). This model includes a formal definition of the syntactic structures and hence the sentences generated by the grammar. Realization rules (the rules by which the set of features, computed by the network traversal, are assembled into an English sentence) are not fully treated, though an outline is given of how they could be formulated in a first-order sorted logic.

Chapter 6 describes the implementation of SLANG, and Appendix B contains some sample sentences it generated. Appendix A contains a tutorial of the OPS5 production language.

One serious shortcoming mars the overall message of the book. This is the inadequate treatment of presentational planning issues. It has become increasingly clear over the last decade that realization—i.e., the formulation of smallish chunks of information as individual sentences—is but one half of the problem of generating language, the small half at that. The other half involves the collection and organization of material into such chunks, a much less well-understood problem.

This is where the book disappoints. Patten's approach is to use the systemic notion of register—that is, roughly, the characteristics of a particular interaction between interlocutors, situated in time and place—to control the problem-solver-generator by setting crucial choice point values in the grammar network. This operation is called preselection. Once these values have been set, the remaining features are all fully determined and the production rules take care of their collection. Leaving aside the fact that Patten's interpretation of register is highly controversial in systemic linguistics, its use in the book significantly weakens the force of his claims. Naturally, one expects an account of the process of constructing various registers and of determining which points in the grammar registers should minimally control (or if not, how one is to go about making the remaining problem-solving decisions); one expects to find if not a full theory of register, at least a description of the theory underlying register. Almost no such information is given; instead, appeal is made to some text planner to construct, using information on the "semantic stratum", the appropriate values for preselection of appropriate values. Fragments of examples of semantic strata are given, one for a mother-child interaction and one, in an appendix, for a building task, but many questions about their status remain unaddressed: What is a semantic stratum? What information can it contain? How complete are the given strata? Do all mother-child interactions obey the given distinctions? Of the thousands of other locutions with which the mother could chastise and threaten, why are precisely the given sentences generated? What would control further variation? And so forth. The lack of development of a notation with which to control generation—an input notation, in some sense—is a serious shortcoming.

The book's strong points are, therefore, its accessible introduction to systemic grammar, its demonstration that a grammar can be implemented by production rules and treated in a problem-solving paradigm, its formal model of a systemic grammar, and the OPS5 tutorial. The reader will come from the book having learned something about all these matters, though not necessarily convinced that it describes the best paradigm for generation. Still, it is a valuable addition to any collection of books about the art of generating sentences by computer.

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BRIEFLY NOTED

INTEGRATED NATURAL LANGUAGE DIALOGUE: A COMPUTATIONAL MODEL

Robert E. Frederking
(Siemens, A.G.)

Boston: Kluwer Academic Publishers, 1988, xvii + 178 pp.
(The Kluwer International Series in Engineering and
Computer Science; Natural Language Processing and
Machine Translation)
ISBN 0-89838-255-6, \$39.95 (hb)

Frederking describes a prototype natural language interface with two special features. First, the system is integrated in the sense that all processing—syntactic, semantic, pragmatic—is performed in the one module, written as a set of production rules. Second, there is particular attention to the resolution of elliptical utterances in the dialogue.

Frederking claims that "no other system can handle the range of ellipsis phenomena" (p. 5) that his can, though this is not backed up with any point-by-point comparison with other research. For example, the extensive work of the Linguistic String Project (e.g., Sager 1981; Sager, Friedman, and Lyman 1987) is never mentioned. It is also claimed that the system's virtues "arise naturally from an approach that roughly corresponds to models of human natural language processing" (p. 160), although there is no consideration of any psycholinguistic models. Webber's (1978) work on verb-phrase ellipsis is not discussed (though there is passing mention of her formal approach to discourse representation); Frederking apparently rejects Webber's conclusions as to what representations and processes are required in VP ellipsis resolution but doesn't say why.

The content of the book is Frederking's Ph.D. thesis from Carnegie Mellon University, with only the addition of an index and a change of title. (In the thesis title, "integrated" qualified "model", not "dialogue"; the significance of the change is unclear.) Only a small part of the book (20 pages) discusses theoretical aspects of the work; the bulk concerns details of the implementation in OPS5 (58 pages), and long annotated traces of the program (54 pages), with introduction, literature review, and conclusions taking the remaining space. Thus conference or journal publication might have been more

appropriate, with publication of the thesis as a technical report and by University Microfilms sufficing for the few readers who require the gory details.—G.H.

REFERENCES

- Sager, Naomi 1981 *Natural Language Information Processing*. Addison-Wesley, Reading, MA.
 Sager, Naomi; Friedman, Carol; and Lyman, Margaret S. 1987 *Medical Language Processing: Computer Management of Narrative Data*. Addison-Wesley, Reading, MA.
 Webber, Bonnie Lynn 1978 *A Formal Approach to Discourse Anaphora* (Outstanding Dissertations in Linguistics). Garland Publishing, New York, NY.

MEANING AND MENTAL REPRESENTATIONS

Umberto Eco, Marco Santambrogio, and Patrizia Violi (eds.)

Bloomington, IN: Indiana University Press, 1988, 237 pp.
 ISBN 0-253-33724-0, \$29.95 (hb); ISBN 0-253-20496-8,
 \$12.95 (sb)

MENTAL REPRESENTATIONS: THE INTERFACE BETWEEN LANGUAGE AND REALITY

Ruth M. Kempson (ed.)
 (University of London)

Cambridge, England: Cambridge University Press, 1988, viii + 229 pp.
 Hardbound, ISBN 0-521-34251-1 (hb)

These two collections exemplify opposite approaches to mental representation and the question of how cognition relates to language and reality. Eco, Santambrogio, and Violi start from European semiotics and try to build a bridge to Anglo-American philosophy of language and artificial intelligence. Kempson, on the other hand, looks at current linguistic theories, including GB and situation semantics, with a heavy leaning towards relevance theory. The papers in the two books are as follows:

Eco, Santambrogio, and Violi:

- "Introduction", Marco Santambrogio and Patrizia Violi
- "On the Circumstantial Relation Between Meaning and Content", Jon Barwise
- "On Truth. A Fiction", Umberto Eco
- "Quantification, Roles and Domains", Gilles Fauconnier
- "Conceptual Semantics", Ray Jackendoff
- "How is Meaning Mentally Represented?", Philip N. Johnson-Laird
- "Cognitive Semantics", George Lakoff
- "The Analysis of Nominal Compounds", Wendy G. Lehnert
- "Identity in Intensional Logic: Subjective Semantics", Bas van Fraassen
- "Reference and its Role in Computational Models of Mental Representations", Yorick Wilks

Kempson:

- I. Introduction
- "The Relation Between Language, Mind, and Reality," Ruth M. Kempson
- II. On the Direct Interpretation of Natural Languages
- "Contexts, Models, and Meanings: A Note on the Data of Semantics", James Higginbotham
- "Facts in Situation Theory: Representation, Psychology, or Reality", Robin Cooper
- "Relational Interpretation," Elisabet Engdahl
- III. On the Syntactic Base for Interpretation

- "Bound Variable Anaphora", Robert May
- "On Implicit Arguments", Michael Brody and M. Rita Manzini
- IV. On Internal Representations and Natural Language Use
- "Representation and Relevance", Deirdre Wilson and Dan Sperber
- "Implicature, Explicature, and Truth-Theoretic Semantics", Robyn Carston
- "So as a Constraint on Relevance", Diane Blakemore
- V. The Language Faculty and Cognition
- "On the Grammar-Cognition Interface: The Principle of Full Interpretation", Ruth M. Kempson

JAPANESE TONE STRUCTURE

Janet B. Pierrehumbert and Mary E. Beckman
 (AT&T Bell Labs and The Ohio State University)

Cambridge, MA: The MIT Press, 1989, ix + 282 pp.
 (Linguistic Inquiry Monographs 15)
 ISBN 0-262-66063-6, \$15.95 (sb)

Japanese tone structure provides a thorough, phonetically grounded description of accent and intonation in Tokyo Japanese, and uses it to develop an explicit account of surface phonological representation. . . . The authors' broader purpose, however, is to develop a general theory of surface representation that can capture salient facts about prosodic structure in all languages and provide a suitable input to phonetic rules. —*From the publisher's announcement*

BOOKS RECEIVED

Books listed below that are marked with an asterisk will be reviewed in a future issue.

Readers who wish to review books for the journal should write, outlining their qualifications, to the book review editor, Graeme Hirst, Department of Computer Science, University of Toronto, Toronto, Canada M5S 1A4. Obviously, we cannot promise the availability of books in anyone's exact area of interest.

Authors and publishers who wish their books to be considered for review in *Computational Linguistics* should send a copy to the book review editor at the address above. All books received will be listed, but not all can be reviewed.

Readings in Distributed Artificial Intelligence by Alan H. Bond and Les Gasser (eds.)
 (California Institute of Technology and University of Southern California, resp.)
 San Mateo, CA: Morgan Kaufmann Publishers, 1988, xvii+649 pp.
 ISBN 0-934613-63-X, \$29.95 (sb)

Computer Applications in Language Learning by Theo Bongaerts, Pieter de Haan, Sylvia Lobbe, and Herman Wekker (eds.)
 (University of Nijmegen)
 Dordrecht: Foris Publications, 1988, vii+171 pp.
 ISBN 90-6765-400-0, Dfl 68.50 (sb)

The Artificial Intelligence Debate: False Starts, Real Foundations by Stephen R. Graubard (ed.)
 Cambridge, MA: The MIT Press, 1988, 311 pp.
 (Originally published as issue 117(1) of *Daedalus*, Winter 1988.)
 ISBN 0-262-57074-2, \$9.95 (sb)