

ation of many strings. Rule-based systems can do better, but the rules are based on years of study by phoneticians, and are not only complex, but are supplemented by large lists of lexical exceptions.

Presumably a connectionist system that could be taught rules as well as learn from example would outperform both versions; and that is what a human seems to be—a system that can be taught rules and that can learn by example how to apply and when to bend the rules. Levelt's machine is not human-like in this respect. It knows and uses rules. It may even abstract rules from multiple examples. But the rules of the machine do not allow easy context-dependence, analogy, or the use of similarity.

One of our annoyances with this fine book is that very often, a point is settled, without evidence, by a comment that so-and-so is very unlikely. In many of these cases we find so-and-so to be quite probable. A typical example is the comment (p. 18) that it is "an unlikely assumption that the speaker articulates sentence i while formulating sentence $i + 1$." On the contrary, it seems to us unlikely that the speaker ever articulates just one sentence without at the same time formulating future sentences that contribute to a developing argument. This is a difference of opinion that is unlikely to be resolved by experiment, but it illustrates the general point.

In sum, our reaction to the book as an engineering design for a machine that might speak like a human is "magnificent," but as a description of how people speak, "we remain unconvinced."

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- Sejnowski, T. J. and Rosenberg, C. R. 1987 "Parallel Networks That Learn to Pronounce English Text." *Complex Systems*, 1:145–168.
- M. Martin Taylor* obtained his B.A.Sc. in Engineering Physics at University of Toronto, his M.S.E. in Industrial Engineering at The Johns Hopkins University, and his Ph.D. in Psychology at The Johns Hopkins University. He holds the position of Senior Experimental Psychologist at the Defence and Civil Institute of Environmental Medicine in Toronto. *Insup Taylor* obtained her B.A. at Seoul National University, and her M.A. and Ph.D. at The Johns Hopkins University, all in psychology. She is the project director of McLuhan–Nanjing Cooperative Project on Literacy. They are the co-authors of *The Psychology of Reading* (Academic Press, 1983) and *Psycholinguistics: Learning and Using Language* (Prentice-Hall, 1990). Martin Taylor's address is: DCIEM, P.O. Box 2000, North York, Ontario, Canada M3M 3B9. Insup Taylor's address is: McLuhan Program, University of Toronto, 39A Queen's Park Cres. E., Toronto, Ontario, Canada M5S 1A1. E-mail for both authors: mmt@zorac.dciem.dnd.ca
- This review is also published as DCIEM Technical Report 89-N-52.

BRIEFLY NOTED

ENGLISH SYNTAX

C. L. Baker

Cambridge, MA: The MIT Press, 1989, xv + 500 pp.
Hardbound, ISBN 0-262-02287-7, \$27.50

THE SYNTACTIC PHENOMENA OF ENGLISH

James D. McCawley
(University of Chicago)

Chicago: University of Chicago Press, 1988, liii + 768 pp. in two volumes
Hardbound, ISBN 0-226-55623-9 and -55625-5, \$60.00 per volume; softbound, ISBN 0-226-55624-7 and -55626-3, \$19.95 per volume

Although intended as textbooks for a course in English syntax, both Baker's and McCawley's books could also serve as useful reference books on orthodoxies of, and constraints upon, the structures of English, including the more esoteric and interesting ones. Both books have roots in generative transformational syntax, though they attempt to be relatively theory-neutral. Thus, in contrast to the surface-oriented analysis of Quirk et al.'s *A Comprehensive Grammar of the English Language* (1985), these treatments emphasize structure and constituency.—G.H.

REFERENCES

- Quirk, R.; Greenbaum, S.; Leech, G.; and Svartvik, J. 1985 *A Comprehensive Grammar of the English Language*. Longman, London.

THE RECOGNITION OF SPEECH BY MACHINE—A BIBLIOGRAPHY

Arthur S. House
(Institute for Defense Analysis)

London: Academic Press, 1988, vii + 498 pp.
Hardbound, ISBN 0-12-356785-8, \$49.00

Approximately 4500 works on automatic speech recognition are listed, indexed by author and subject. The compiler has tried to include as much up-to-date material as possible, with some historical coverage as well. Comprehensiveness is not claimed, particularly for material not published in English.

FREQUENCY ANALYSIS OF ENGLISH VOCABULARY AND GRAMMAR, BASED ON THE LOB CORPUS. VOLUME 1: TAG FREQUENCIES AND WORD FREQUENCIES. VOLUME 2: TAG COMBINATIONS AND WORD COMBINATIONS

Stig Johansson and Knut Hofland
(University of Oslo and Norwegian Computing Centre for the Humanities)

Oxford: Clarendon Press, 1989, Vol 1: vii + 400 pp., Vol 2: v + 380 pp.
Hardbound, Vol 1: ISBN 0-19-824221-2, Vol 2: 0-19-824222-0

This book is based on a grammatically analyzed ("tagged") version of the Lancaster–Oslo/Bergen (LOB) Corpus, which is a

broadly representative collection of present-day British English texts. Principal new features are the surveys of word-class combinations and word combinations.

The corpus is analyzed on four levels. Volume 1 contains the analysis of word-class frequencies, giving detailed information on the frequency of nouns, verbs, adjectives, etc., in the complete corpus and in the different text categories of the corpus; and word frequencies, giving an alphabetical list of all the words in the corpus and specifying the frequency of different grammatical uses of the words. Volume 2 contains the analysis of word-class combinations, providing detailed information on the preceding and following "neighbors" of each word class; and word combinations, listing combinations for a selection of frequent nouns, verbs, and adjectives.—*From the publisher's announcement*

RECENT DEVELOPMENTS AND APPLICATIONS OF NATURAL LANGUAGE PROCESSING

Jeremy Peckham (ed.)
(Logica)

London: Kogan Page, 1989, xiv + 272 pp.
(UNICOM Applied Technology reports)
Hardbound, ISBN 1-85091-682-9, £50.00

This book is a collection of papers presented at the UNICOM seminar on Recent Developments and Applications in Natural Language Understanding in December 1987. The purpose of the seminar was to draw together both users and developers of Natural Language Processing technology.—*From the preface*

The contents of the volume are:

Commercial Markets for NLP Products, by Tim Johnson and Christine Guilfoyle; Computer-Based Editorial Aids, by Robert Dale; (Non)-Compositionality and Translation, by Doug Arnold and Louisa Sadler; Japanese for Speakers of English: The UMIST/Sheffield Machine Translation Project, by Mary McGee Wood; Machine Translation in the Commercial Environment, by Marianne Medhurst; Using a Knowledge Base for Automatic Text Classification, by Jackie Fenn; Natural Language Requirements for Expert System Naive Users, by Dan Diaper and Tony Shelton; VODIS—A Voice Operated Database Enquiry System, by Jeremy Peckham; Speech Language Translation, by Martin Steer; Speech Simulation Studies: Performance and Dialogue Specification, by Alan Newell; Alvey Initiatives in Natural Language Processing, by Brian Oakley; WH-Questions and Intensional Logic, by Alan Ramsay; Events and VP Modifiers, by Steve Pulman; On-Line Lexical Resources for Natural Language Processing, by Bran Boguraev; Discourse Structure in LOQUI, by Tom Wachtel; Communication Failure in Dialogue: Implications for Natural Language Understanding, by Ronan Reilly; Conceptual and Semantic Co-ordination in Dialogue: Implications for the Design of Interactive Natural Language Interfaces, by Simon Garrod.

ELECTRIC WORD (Formerly *Language Technology* incorporating *Language Monthly*)

Louis Rossetto (ed.)
Amsterdam: Language Technology BV, bimonthly

ISSN 0921-2787, \$50/year (personal), \$95/year (institutional)
(Subscriptions: P.O. Box 70486, 1007 KL Amsterdam, The Netherlands)

We can be sure that natural language processing has really arrived as an important industry now that it has its very own trade magazine. *Electric Word* covers all aspects of crunching lexemes, from word processing through to machine translation and natural language understanding.

Electric Word is a magazine rather than an academic journal. It carries news, reports of new products, software and book reviews, and profiles of people in the industry; as well as articles on such topics as MT in Japan, European corporate approaches to multilingualism and translation, and commercial speech recognition. There's a strong emphasis on real-world applications, and on the European language industries. Articles are pitched at the nonexpert level.

The magazine is self-consciously racy. That means that its graphics and layouts sometimes border on the unreadable, it has headlines like "Urdu-wop-showaddy-waddy" (on an item about an Urdu interface), and it uses the word *fuck* rather more often than, say, *Computational Linguistics* does. Now in its third year, its second publisher, and its second or third or fourth name (depending on how you count them), the magazine may or may not have stabilized. But it has an infectious enthusiasm that makes it fun to read.—*G.H.*

ON MONOSEMY: A STUDY IN LINGUISTIC SEMANTICS

Charles Ruhl
(Old Dominion University)

Albany, NY: State University of New York Press, 1989, xvi + 299 pp.
(SUNY Series in Linguistics)
Hardbound, ISBN 0-88706-946-0, \$54.50; Softbound, ISBN 0-88706-947-9, \$17.95

In this book, Charles Ruhl argues that words should be presumed initially to be monosemic: having a single, highly abstract meaning. Semantic research should first seek a unitary meaning, resorting to polysemy, homonymy or idiomaticity only when an extended attempt fails. Using a large database, Ruhl shows that some supposed "lexical" semantic meaning is actually pragmatic or extralinguistic. Included are extensive treatments of the verbs *bear*, *hit*, *kick*, and *slap*, the phrase *take off*, and the noun *ice*.—*From the publisher's announcement*

INTERLINGUISTICS: ASPECTS OF THE SCIENCE OF PLANNED LANGUAGES

Klaus Schubert (ed., in collaboration with Dan Maxwell)
(BSO/Research)

Berlin: Mouton de Gruyter, 1989, vii + 348 pp.
(Trends in Linguistics; Studies and Monographs 42)
Hardbound, ISBN 3-11-011910-2 and 0-899-25548-5, DM 148

Schubert, the editor of this book, is a computational linguist presently working on the DLT machine translation system, which uses Esperanto as an interlingua. In the book, *interlinguistics* means the study of planned (or, pejoratively, *artificial*) languages such as Esperanto, Volapük, etc. Schubert has collected 18 papers (in English, or translated into English), covering sociolinguistic, psycholinguistic, theoretical, and literary aspects of planned languages.

METATAXIS: CONTRASTIVE DEPENDENCY SYNTAX FOR MACHINE TRANSLATION

Klaus Schubert
(BSO/Research)

Dordrecht: Foris Publications, 1987, 250 pp.
(Distributed Language Translation 2)
Hardbound, ISBN 90-6765-358-6, \$37.00; Softbound, ISBN
90-6765-359-4, \$24.90

Schubert derives the word *metataxis* from Tesnière's *métataxe*, as used in his original treatment of dependency grammar. It is used to mean the mapping from a source language syntactic dependency structure to that of a target language. Schubert holds that this is a primary process in language translation, and reports that the Distributed Language Translation Project has constructed metataxes (i.e. dependency transfer rule systems) for English to Esperanto and Esperanto to French.

The first four chapters present a history of dependency theory and a discussion of its linguistic basis. Dependency is defined as directed co-occurrence of morphemes. It can be determined by distributional studies of the co-occurrence of words and phrases in utterances. If we consider the sentence "Very interesting people arrive," we can observe that "they" can be substituted for "very interesting people" and maintain grammaticality in "they arrive." Similarly, the substitution of "people" for the phrase maintains grammaticality. But the substitution of "very" or "very interesting" for the whole phrase results in ill-formed utterances such as *"very arrive" or *"very interesting arrive." An essential criterion for dependency appears to be that the word that cannot be omitted from the phrase under substitution criteria is the governor of the phrase. Within the phrase, applying the substitution process to "the very interesting people" shows that "the people" and "interesting people" are both well-formed phrases, and that "people" dominates "the" and "interesting." But "very people" is badly formed, while "very interesting" is good. Thus "interesting" governs "very." At the sentence level, the verb is taken (mainly by convention) to govern subject, object, and complements. It also appears to be by convention, rather than substitution criteria, that prepositions and conjunctions become governors of their phrases. Directed arcs, labeled by their syntactic function, connect a governing term and its dependents.

Detailed examples of dependency analysis are offered in several different languages, and the process of metataxis is explained in

detail. Metataxis rules are simply mappings of dependency structures of one language to those required by another. The rules are indexed by governing morphemes, and are in the form of a morpheme dominating constrained variables as dependents. Metataxic rules are also used in the dictionary to map from a single word in one language to phrases in another, or vice versa.

The book is limited to describing the syntactic component of a translation system, and it emphasizes the linguistics of the process, offering few comments on the computational aspects. Generally, it is a good source for scholars with an interest in the linguistics of dependency analysis, and it provides a detailed bibliography of mainly European work in dependency theory. As an approach to machine translation, there is no obvious advantage of metataxis over the customary transfer rules defined on phrase structure constituents.—*Rob't F. Simmons, Department of Computer Science, University of Texas at Austin*

BOOKS RECEIVED

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

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 below. All books received will be listed, but not all can be reviewed.

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.

Situations, Language and Logic

Jens Erik Fenstad, Per-Kristian Halvorsen, Tore Langholm, and Johan van Benthem
(University of Oslo, Xerox Palo Alto Research Center, Stanford University, and University of Amsterdam)
Dordrecht: Reidel, 1987, viii + 186 pp.
(Studies in Linguistics and Philosophy 34)
Hardbound, ISBN 1-55608-048-4, Dfl 125, £38.75

Registers of Written English: Situational Factors and Linguistic Features

Mohsen Ghadessy (ed.)
(National University of Singapore)
London: Pinter Publishers, 1988, ix + 184 pp.
(Open Linguistics Series); (Distributed in the U.S. by Columbia University Press)
Hardbound, ISBN 0-86187-989-9, \$49.00

†L'inference en langue naturel: Le problème des connecteurs; Représentation et calcul (Inference in Natural Language: The Problem of the Connectors; Representation and Computation)

Jacques Jayez (Ecole des hautes études en sciences sociales)
Paris: Hermès, 1988, 287 pp.
(Langue, raisonnement, calcul)
Hardbound, ISBN 2-86601-118-X, FF 195