

- Benign neglect of syntax was once a healthy reaction to transformational grammar, but the field is now mature enough to accommodate more syntactic sophistication.
- And for practical systems, naturalness, readability, and ease of use become crucial.

In summary, this book is an exciting record of work in progress. It assumes too much background material to be used as an introductory textbook, but it could be used in a seminar course on knowledge representation, either with supplementary lectures on logic and philosophy or with programming exercises that show students how to implement such networks. By presenting fourteen systems in one volume, it invites detailed comparisons that can help knowledge engineers select the best features for their future designs.

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Discourse Production - A Computer Model of Some Aspects of a Speaker

Anthony Davey

Edinburgh Univ. Press, Scotland, 1978,
170 pp., \$16.00, ISBN 0-85224-339-1.

"This book describes a computer program that produces English discourse. The program is capable of describing in a sequence of English sentences any game of noughts and crosses (tic-tac-toe), whether given or actually played with the program." (From the Preface.)

The game descriptions have several properties that make them non-trivial. The entities of the game are referred to by fairly natural English noun phrases, making use of anaphora and standard constructions for qualification (such as relative clauses), and taking advantage of symmetry of the board. In many cases, moves are described for their strategic value, and some mistakes of the program's opponent are mentioned. The following sentence produced by the program illustrates these properties. *If you had blocked my line, you would have threatened me, but you took the corner adjacent to the one which you took first and so I won by completing my line.* This also illustrates that the program uses connectors like *and*, *but*, *so*, and *although*, to string clauses together in coherent discourse.

The grammatical theory used by the author is systemic grammar, essentially the version developed by R. A. Hudson in *English Complex Sentences*, North-Holland, 1971. In this theory, a grammatical item (such as a clause) is classified by an associated bundle

of features. *Feature-realization* rules determine a set of *functions* (like SUBJECT) for constituents. *Structure-building* rules manipulate functions, gathering them into bundles, one for each constituent. *Function-realization* rules associate feature bundles with these function bundles, and the cycle continues, down to the word level. On each level there is some freedom of choice for the features of an item, but there is a network of constraints on co-occurring features called the *system-network*.

In Davey's adaptation, semantic representations are carried along with the above sort of syntactic representations, and "specialist" procedures are used to determine features of grammatical items where there is freedom left in the system-networks. The overall control, however, is not strictly top-down as in Hudson's system described above. Sometimes specialist procedures actually construct the English text for an item *before* determining all of its features.

It is unfortunate that the book did not reach published form earlier. The work was done in the period 1970-1973 as the author's thesis at Edinburgh University. A chapter devoted to *A Review of Previous Systems* essentially covers only what was published by 1972. The program does not take account of advances made in systemic grammar since around 1972. Some of the constructions made by the program seem less direct than they should be, and this would be improved in the light of later developments.

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