

# Briefly Noted

## Syntax and Parsing

Paul Gorrell

(University of Potsdam)

Cambridge University Press (Cambridge Studies in Linguistics, edited by Joan Bresnan et al., volume 76), 1995, xi+170 pp; hardbound, ISBN 0-521-45282-1, \$44.95

Gorrell presents a psycholinguistic model of human parsing in which specific properties of syntactic knowledge play a crucial role in determining ambiguity-resolution behavior. The proposal builds on work in deterministic parsing, relating it to grammar-based accounts of human syntactic preferences and garden-path behavior. Other grammar-based approaches have attempted to derive performance data from the content of particular syntactic constraints and how well they are satisfied on-line. Gorrell instead proposes that the significant factor for human processing is the distinction between different types of structural information that are brought to bear in syntactic analysis. The classification of information types determines a natural modularization of the human parser, which is argued to account for the behavioral properties observed. The approach has potential interest for computational linguists who are interested in the grammatical underpinnings of natural language understanding systems, and in the problem of deriving the best parse for an ambiguous utterance. In particular, issues of information encapsulation and its consequences for incremental interpretation are of great importance for cognitive models of language as well as practical NLU systems. Unfortunately, computational linguists are likely to be less than satisfied by the lack of precision in Gorrell's specification of his model, and by the absence of a firm computational foundation for his claims.

The focus of Gorrell's proposal is the division of structural information into primary and secondary relations. The primary relations are the primitives that are necessary to a specification of the parse-tree structure (i.e., dominance and precedence). The secondary relations are grammatical concepts that are defined in terms of the resulting tree (e.g., *c-command* and *government*). The distinction is reflected in the processing of the two types of information: Primary relations are *asserted* by a structure-building

module, and secondary relations are *evaluated* within the resulting tree by a separate structure interpreter. Given the distinction between building a structure and verifying relations within that structure, Gorrell argues for a new kind of determinism in parsing, called structural determinism, which applies only to the structure-building module. The constraints on the operation of the structure builder underlie Gorrell's account of human disambiguation.

The book is thorough in its review of Government-Binding theory (the grammatical framework assumed by Gorrell) and of GB-based models of human parsing. Other aspects of the book are less complete, leaving a number of questions unanswered. For example, given that assertions of primitive relations cannot be retracted in normal parsing, the mechanism for determining which assertions to make is of critical importance. Gorrell proposes that the structure-building module is driven to "[attempt] incrementally to satisfy principles of grammar." As stated, this entails that the structure builder needs to judge the satisfiability of syntactic constraints in order to make assertions about the parse-tree structure. However, evaluating the structural conditions under which those constraints are satisfied is the purview of the structural interpreter, for which it in turn needs the assertions about the basic tree structure. The strict modularization of the proposed model is the foundation of Gorrell's proposal, but it is not clear how the division can be maintained, given that the operation of each module depends on information provided by the other.

The book focuses on a topic in psycholinguistics that should be of great importance in building parsers that can mimic human behavior and respond to human expectations. However, the relevance of the particular proposal for computational linguists is less established, given the loose development of the specific components of the model. Computational linguists who model human sentence-processing behavior will find an interesting discussion of some familiar issues in the field (such as form- versus content-based preference strategies, and modularity). The impact of the central proposal awaits a more thorough and precise development of the details of the model.—*Suzanne Stevenson, Rutgers University*

## Linguistics and Computation

Jennifer Cole, Georgia M. Green, and Jerry L. Morgan (editors)  
(University of Illinois at Urbana-Champaign)

Stanford, CA: Center for the Study of Language and Information (CSLI Lecture Notes 52), distributed by Cambridge University Press, 1995, xi+296 pp; hardbound, ISBN 1-881526-82-8, \$49.95; paperbound, ISBN 1-881526-81-X, \$22.95

"The papers in this volume were presented at a workshop held in June 1991 at the University of Illinois at Urbana-Champaign, in celebration of the twenty-fifth anniversary of the Department of Linguistics. The broad theme of the workshop was *Computational Linguistics and the Foundations of Linguistic Theory*, and its purpose was to provide a forum in which computational linguists, syntacticians, morphologists, and phonologists could come together and discuss important issues of common interest.

The areas of linguistic research represented in this volume are diverse, yet they are united under the notion that the principles of grammatical well-formedness and the principles of language processing are interdependent. . . . The fact that many of the papers included here span several areas within linguistic theory underscores the importance of communication between researchers in diverse areas."—*From the preface*

The contents of the volume are as follows:

- "Formal devices for linguistic generalizations: West Germanic word order in LFG" by Annie Zaenen and Ronald M. Kaplan
- "Stratified feature structures for multistratal relational analyses" by David E. Johnson and Lawrence S. Moss
- "Feature-based grammars as constraint grammars" by Alan M. Frisch
- "A quarter century of computation with transformational grammar" by Robert C. Berwick and Sandiway Fong

"Chunks and dependencies: Bringing processing evidence to bear on syntax" by Steven Abney

"Some open problems in head-driven generation" by Dale Gerdemann and Erhard Hinrichs

"Construction of LR parsing tables for grammars using feature-based syntactic categories" by Tsuneko Nakazawa

"Phonology and computational linguistics—a personal overview" by John Coleman

"Eliminating cyclicity as a source of complexity in phonology" by Jennifer S. Cole

"Pitch accent prediction from text analysis" by Julia Hirschberg and Richard Sproat

[*The volume contains no index.*]

## Formal Issues in Lexical-Functional Grammar

Mary Dalrymple, Ronald M. Kaplan, John T. Maxwell III, and Annie Zaenen (editors)  
(Xerox Palo Alto Research Center and Stanford University)

Stanford: Center for the Study of Language and Information (CSLI Lecture Notes 47), 1995, xx+449 pp; hardbound, ISBN 1-881526-37-2, \$47.50; paperbound, ISBN 1-881526-36-4, \$18.95

"We have pulled together into a single volume a set of papers by ourselves and our colleagues that address some of the developments [in Lexical-Functional Grammar] of the past years. This book outlines work in formal issues in LFG theory in the twelve-year period from 1982 to 1994. We have included papers on a range of topics that have been central in LFG research during this period. In particular, we have tried to include those papers which have been most influential, as well as those that have previously been most inaccessible."—*From the introduction*