

# *Trends in Linguistics*

*Studies and Monographs 19*

*Computers in  
Language Research  
Volume 2*

*Walter A. Sedelow  
Sally Yeates Sedelow (Eds.)*

MOUTON

# **Computers in Language Research**

Volume 2

edited by Walter A. Sedelow, Jr.  
and Sally Yeates Sedelow

In the earlier companion volume to this one (**Computers in Language Research: Formal Methods**, The Hague: Mouton, 1979) introductions to several notations and their use as theory or model were discussed in terms of their application to the analysis of language with intimations of the power of expanding that application.

In the set of papers presented in this volume we see a sample of preliminary results of the power of formalization. Considered from the viewpoint that the amount of information processing capability that has been brought to bear on science is, in historical perspective, very small, and the fraction on the science of language disproportionately smaller still, the contributions brought together here are in a number of respects truly pioneering.

ISBN 90 279 3009 0

# Trends in Linguistics

## Studies and Monographs 19

*Editor*

Werner Winter

Mouton Publishers  
Berlin · New York · Amsterdam

# Computers in Language Research 2

Part I: Formalization in Literary  
and Discourse Analysis

Part II: Notating the Language of Music,  
and the (Pause) Rhythms of Speech

*Edited by*

Walter A. Sedelow, Jr.  
Sally Yeates Sedelow

Mouton Publishers

Berlin · New York · Amsterdam

Sally Yeates Sedelow, Ph.D.  
Professor of Computer Science and of Linguistics  
The University of Kansas, Lawrence

Walter A. Sedelow, Jr., Ph.D.  
Professor of Computer Science and of Sociology,  
and in the Program for the History & Philosophy of Science,  
The University of Kansas, Lawrence

*Computers in Language Research: Formalization in Literary and Discourse Analysis and Notating the Language of Music, and the (Pause) Rhythms of Speech* is the companion volume to *Computers in Language Research: Formal Methods*, Trends in Linguistics (Studies and Monographs), volume 5.

#### Library of Congress Cataloging in Publication Data

Computers in language research 2.

(Trends in linguistics. Studies and monographs; 19)

Includes bibliographies.

Contents: pt. 1. Formalization in literary and discourse analysis -- pt. 2. Notating the language of music and the (pause) rhythms of speech.

1. Linguistics--Data processing. 2. Music--Data processing. 3. Formal languages.  
I. Sedelow, Walter A. II. Sedelow, Sally Yeates, 1931- . III. Title: Computers  
in language research two. IV. Series.

P98.C6129 1983 410'.28'5 83-011476

ISBN 90-279-3009-0

© Copyright 1983 by Walter de Gruyter & Co., Berlin. All rights reserved, including those of translation into foreign languages. No part of this book may be reproduced in any form -- by photoprint, microfilm, or any other means -- nor transmitted nor translated into a machine language without written permission from Mouton Publishers, Division of Walter de Gruyter & Co., Berlin. Typesetting: Grestun Graphics, Abingdon. -- Printing: Druckerei Hildebrand, Berlin. -- Binding: Lüderitz & Bauer Buchgewerbe GmbH.

Printed in Germany.

# Contents

## Part I: Formalization in literary and discourse analysis

Walter A. Sedelow, Jr. and Sally Yeates Sedelow	
Science and human language	1
John B. Smith	
Computer criticism	
1. Introduction	25
2. Textual processing	28
3.1 Computer criticism: Materialist view of a text	31
3.2 Conventional criticism: Materialist view of a text	34
4.1 Computer criticism: Concepts of structure	38
4.2 Conventional criticism: Concepts of structure	45
5. Computer criticism: Temporal and behavioral extensions	52
6. Computer criticism: Interpretation of form	54
Notes	58
References	58
Yorick A. Wilks	
Machine translation and the artificial intelligence paradigm of language processes	
Preface	61
1. Some background	63
2. Winograd's understanding system	65
3. Some discussion of SHRDLU	69
4. Second generation systems	73
4.1 Charniak	74
4.2 Colby	76
4.3 Simmons	78
4.4 Schank	81
4.5 Wilks	85

5. Some comparisons and contrasts	91
5.1 Level of representation	92
5.2 Centrality	93
5.3 Phenomenological level	95
5.4 Decoupling	95
5.5 Availability of surface structure	96
5.6 Application	97
5.7 Forward inference	98
5.8 The justification of systems	99
6. English	100
Notes	104
References	105

**Bertram Bruce**

Belief systems and language understanding	
1. The role of beliefs in natural language understanding	113
2. A theory of personal causation	117
3. Social actions	124
3.1 Aspects of actions	124
3.2 REQUEST	126
4. Pattern of action	130
4.1 Types of patterns in social situations	130
4.2 Social action paradigms	131
4.3 The social action paradigm *REQUEST*	134
5. The use of belief systems knowledge for language understanding	136
Acknowledgements	141
Notes	141
References	141
Appendix I: Notation conventions	144
Appendix II: Social actions	145

**Part II: Notating the language of music, and the (pause) rhythms of speech**

Walter A. Sedelow and Sally Yeates Sedelow	
Encoding	163
Notes	168
References	169

Raymond Erickson and Anthony B. Wolff.

The DARMS Project: implementation of an artificial language for the representation of music

1. Introduction: music, mathematics and language	
1.1 Historical precedents	171
1.2 Twentieth-century viewpoints	172
2. History of the DARMS Project	175
2.1 Automated music printing	179
2.2 Musicological applications	181
2.2.1 Data-bank of DARMS-encoded scores	181
2.2.2 Computer-assisted style analysis	181
3. Summary of DARMS grammar and syntax	182
3.1 Some fundamental concepts: tokens and facilities	182
3.2 DARMS musical symbols: codes for note/rest information	190
3.2.1 Vertical position	191
3.2.2 Accidentals	192
3.2.3 Non-normative noteheads	192
3.2.4 Duration Codes	192
3.2.5 Ties	194
3.2.6 Stem Codes	194
3.2.7 Tremolos	194
3.2.8 Beams	195
3.2.9 Articulation	196
3.2.10 Fingerings	197
3.2.11 Ornaments	197
3.2.12 Slurs	197
3.2.13 Figured-Bass Code	198
3.2.14 Double-stemmed notes	198
3.3 Codes for other musical symbols	199
3.3.1 Clefs	199
3.3.2 Key signatures	199
3.3.3 Meter signatures	200
3.3.4 Barlines	200
3.3.5 Dynamics	200
3.3.6 Literal	201
3.3.7 Repetition signs	202
3.3.8 Dictionary of additional symbols	202
3.4 Special codes	202
3.4.1 Codes necessary for accurate encoding	202
3.4.2 Convenience codes	203
3.5 Summary of DARMS abbreviations and defaults	204
3.5.1 Space Code	204



3.5.2 Duration Code	205
3.5.3 Equate Codes	205
4. Psycho-linguistic problems and considerations in the implementation of DARMS	206
5. Conclusion	215
Notes	216
References	217
Daniel.C. O'Connell and Sabine Kowal	
Pausology	
1. Introduction	221
2. The early period of research (up until 1945)	223
3. The period from 1945 to 1950	229
4. The period from 1951 to 1960	231
5. The period from 1961 to 1970	236
6. The schools	246
7. Recent research (from 1971 to the present)	257
8. Summary and conclusions	272
8.1 Multidetermination	272
8.2 Methodological defects	273
8.3 Ahistoricity	273
8.4 Theory	274
8.5 Some perspectives	275
Note	277
References	277