

ON COMMUNICATION. AN INTERDISCIPLINARY AND MATHEMATICAL APPROACH

by

JURGEN KLÜVER

University of Duisburg-Essen

and

CHRISTINA KLÜVER

University of Duisburg-Essen

TABLE OF CONTENTS

CONTENTS	v
PREFACE	vii
CHAPTER 1 / Introduction: Communication – Problems of a Concept and a New Methodical Approach	1
CHAPTER 2 / Excursion into Complex Systems Theory	7
2.1. General Concepts	7
2.2. Universal Modeling Schemas and Models of Soft Computing	15
2.3. Complex Systems Approach and Systems Dynamics	21
CHAPTER 3 / Meaning and Information: The Semantic Dimension of Communication	25
3.1. The Meaning of Meaning	25
3.2. Information and the Vector of Expectation	42
3.3. A Computational Model	55
3.4. Relevance and Evaluation of Messages	62
CHAPTER 4 / The Social Dimension of Communication	67
4.1. The Modeling of Social Interactions	68
4.2. Social Topology and Communication: An Example of Opinion Formation	81
4.3. The Emergence of Social Order by Communicative Processes of Typifying	90
4.4. Social Dimensionality and Communication: The Theory of Social Differentiation	104
4.5. The sd-Parameter	111
4.6. Semiotic Production Rules	122
CHAPTER 5 / The Cognitive Dimension of Communication	129
5.1. The Story of Tom	131
5.2. Was it Murder? The Formation of Analogies	138
5.3. Cognitive Functions, Meaning Processing Capacities, and Local Attractors	143

5.4.	The Meaning of Learning	151
5.5.	Sub Symbolic and Symbolic Cognitive Processes	167
CHAPTER 6 / The General Equations of Communicative Processes		179
CHAPTER 7 / Examples: Computer Models as Operationalization		193
7.1.	The Determination of Communication by Meaning, Degrees of Information, and Relevance	194
7.2.	The Impact of Social Structure on Semantical Correspondence	199
7.3.	Expanded Models	213
CHAPTER 8 / Epilogue: The Mathematical Conditions of Human Cognition and Communication		225
BIBLIOGRAPHY		231
INDEX		235