

Myrdene Anderson
Floyd Merrell
(Editors)

On Semiotic Modeling

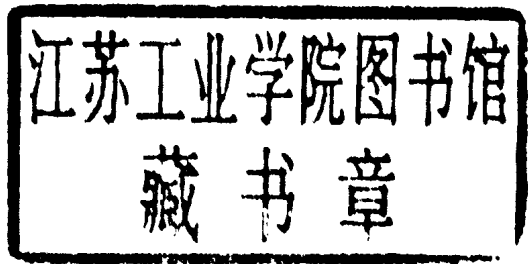
Mouton de Gruyter

On Semiotic Modeling

Edited by

Myrdene Anderson

Floyd Merrell



Mouton de Gruyter

Berlin · New York 1991

Mouton de Gruyter (formerly Mouton, The Hague)
is a Division of Walter de Gruyter & Co., Berlin.

☺ Printed on acid-free paper which falls within the guidelines of
the ANSI to ensure permanence and durability.

Library of Congress Cataloging in Publication Data

On semiotic modeling / edited by Myrdene Anderson and Floyd
Merrell.

p. cm. — (Approaches to semiotics ; 97)

Includes bibliographical references and index.

ISBN 0-89925-642-2 (cloth : acid-free paper)

1. Semiotics. I. Anderson, Myrdene, 1934—

II. Merrell, Floyd, 1937— III. Series.

P99.048 1990

401'.41—dc20

90-45501

CIP

Deutsche Bibliothek Cataloging in Publication Data

On semiotic modeling / ed. by Myrdene Anderson and Floyd
Merrell. — Berlin ; New York : Mouton de Gruyter, 1991

(Approaches to semiotics ; 97)

ISBN 3-11-012314-2

NE: Anderson, Myrdene [Hrsg.]; GT

© Copyright 1991 by Walter de Gruyter & Co., D-1000 Berlin 30

All rights reserved, including those of translation into foreign languages. No part of this
book may be reproduced or transmitted in any form or by any means, electronic or
mechanical, including photocopy, recording or any information storage and retrieval
system, without permission in writing from the publisher.

Typesetter: Asian Research Service, Hong Kong. — Printing: Gerike-Druck, Berlin.

Binding: Dieter Mikolai, Berlin. — Printed in Germany.

On Semiotic Modeling

Approaches to Semiotics

97

Editorial Committee

Thomas A. Sebeok
Roland Posner
Alain Rey

Mouton de Gruyter
Berlin · New York

Contents

Introduction	1
<i>Myrdene Anderson and Floyd Merrell</i>	
Grounding figures and figuring grounds in semiotic modeling	3
Part A Issues of culture	17
<i>Peter C. Reynolds</i>	
Structural differences in intentional action between humans and chimpanzees – and their implications for theories of handedness and bipedalism	19
<i>Bethe Hagens</i>	
‘Venuses’, turtles, and other hand-held cosmic models	47
<i>Vernard Foley</i>	
Toys in engineering history: The role of scale models and miniaturization techniques	61
<i>An Painter</i>	
Maps, territories, and mandalas: The spirit of place	73
<i>Rachel B. Ramadhyani</i>	
Notational systems: The interaction of model and content	97
Part B Issues for science	115
<i>Jesper Hoffmeyer and Claus Emmeche</i>	
Code-duality and the semiotics of nature	117
<i>Mark Levinthal</i>	
The use and misuse of metaphor in biology: Studies of the semantics of molecular evolution	167
<i>Stanley N. Salthe</i>	
Kali theory	185

Myrdene Anderson

The conduct of artificial life: A quest for artificial death? 195

Walter A. Koch

Worlds and signs: Explicate and implicate order 211

Floyd Merrell

Model, world, semiotic reality 247

Robert de Beaugrande

Semiotics and control systems: Toward a non-classical model
of communication 285

Part C Issues in language and literature 325

Thomas A. Sebeok

In what sense is language a 'primary modeling system'? 327

Rostislav Pazukhin

On the semiotic status of written language 341

Walter D. Mignolo

(Re)modeling the letter: Literacy and literature at the intersection
of semiotics and literary studies 357

Eugen Baer

The logic of autobiography 395

James H. Bunn

A semiotic model of conjecture 405

Part D Issues of semiosis 429

Nathan Houser

A Peircean classification of models 431

C.W. Spinks

Diagrammatic thinking and the portraiture of thought 441

Shea Zellweger

Peirce, iconicity, and the geometry of logic 483

<i>Paul Ryan</i>	
'A sign of itself'	509
<i>John Deely</i>	
Modeling anthroposemiosis	525
 Afterword	 595
<i>Myrdene Anderson and Floyd Merrell</i>	
Filling and emptying figures and grounds in art, craft, and science	597
 List of contributors	 603
 Index	 607

Introduction

Grounding figures and figuring grounds in semiotic modeling

Myrdene Anderson and Floyd Merrell

The cosmos teems with a continuous *felt* of signs, some indeed felt — sensed — by mere mortals, some imagined, anticipated, or denied by us, some constituting us biologically, socially, culturally, and psychologically. In this felt, every part and process, every container and connector, stands in some relation with every other. As persuasively argued by Charles Sanders Peirce, a given set of signs depends upon the entire *felt* within which it stands (CP 5.412, CP 5.417, MS 618, MS 619), that whole, which is a ‘sign of itself’ (CP 2.230). But, admittedly, some of these relations seem more meaningful than others with respect to space, time, substance, level of organization, or consequence of that relationship or of our intersection with it. Indeed, without differential connectedness and containerhood — in the absence of a topology of markedness — no pattern would attract our attention and thereby carry significance. For significance, following Gregory Bateson (1970), there must emerge a difference that makes a difference; following Umberto Eco (1978:73-83) and Peirce (CP 5.311-5.317), a sign *means* in terms of the absence marked by its presence, what it is *not*. Even the more tangled relations embody mystery, enmesh us, setting us up for suspense and surprise. Sometimes a fabric of discernible discontinuities leaps out of the *felt* to startle us — as the ‘outward clash’ of Secondness, of what *happens-to-be*, or as a niche out of the Umwelt — only to be absorbed again in the continuum, and vice versa. Modeling all this flip-flopping, without flip-flopping, is the challenge in semiotic modeling.

The semiotic web constituting this cosmic felt might itself be understood as multidimensional links of complementations and multi-valenced synergies — as models and modeling. Our most common connotation of *model* centers on the representation or likeness of the model vis-a-vis its inspiration and/or vis-a-vis its realization, which themselves may be either material or immaterial. Hence, models reek

of iconicity. Signs, especially those of diagrams, metaphors, and images — hypoicons (CP 2.276) — are themselves models, and semiosis constitutes modeling, *par excellence*. When we consciously, unconsciously, or nonconsciously model any phenomenon, it entails, at the very least, a model of a model, a model of modeling, modeling of a model, or/and modeling of modeling. To this extent, one can distinguish models and modeling from representations and representing. 'Modeling' captures the complementation, the provisionality, the *counterfeit* involved in open-ended synergies. 'Representing' by comparison conjures up a highly targeted, *a priori*, nonproblematic closed system.

Modeling, via semiosis and Peirce's objective idealism, allows neither for Fregean determinacy of reference or Tarskian correspondence to the furniture of the world, nor for post-analytic philosophy's rejection of reference and representation altogether. Rather, semiotic modeling stands between both. The model collaborates with the world according to the particular manner in which the community puts it to use, and the world will continue to resist direct representation, regardless of the community's fads, fashions, and fact-mongering.

After these introductory remarks, this corpus is organized around issues of culture, issues for science, issues in language and literature, and issues of semiosis. Orthogonal to this organization flow other dispersed but unifying themes, including those around commensurability, constraints, and emergence (as in the symposium); around representation, conservation, and dissipation; around means and ends; around tools and toys; around form, content, and notation; around similarity and contiguity; around qualification and quantification; and around validity, reliability, and utility generally.

Manipulation, representation, and implementation

Humans have negotiated a unique range of implements which variously facilitate, substantiate, dramatize, and sometimes even negate their mental and physical activities within a modeled natural-cum-cultural universe. The evolution of culture and language in the hominid line, though not reducible, relates somehow to such processes as representation through modeling, manipulation in implementation, and transformation of materials and ideas. Such processes, and the material and mental artifacts themselves, synergistically feed on and into each

other in a tangle of mutable functions and structures. If in any form or fashion they represent the world at all, they can do so only tenuously, provisionally, approximately (i.e., Peirce's convergence theory) (Rescher 1978).

The objects we call tools and toys mimic, as icons, and mesh, as indices. Certainly our dichotomous notions of 'tools' and 'toys' are suspect, and unusually slippery concepts. Even though 'tools' in the prosaic sense may associate with 'work', and 'toys' with 'play', each transforms readily into its counterpart, as poignantly evident in our computer era. From ethology to engineering, several contributors to this volume reinspect the dynamic processes underlying the prosaic, and suspiciously overdetermined, dichotomies entailed in instrumental 'work-tools' and expressive 'play-toys', while other contributors look at less tangible modeling integral to the human condition.

Peter C. Reynolds addresses the evidence for the phylogeny and ontogeny of implementation in his unique studies of human and alloprimate behavior in "Structural differences in intentional action between humans and chimpanzees — and their implications for theories of handedness and bipedalism". As some individuals have assumed, without any systematic documentation until Reynolds' work, human implementation constitutes a qualitatively distinct set of operations. Paramount among the distinguishing features of human action is intentionality, having a cascade of consequences in the realms of cognition, language, and culture. Modeling here is both medium and message, both abstracted and contextualized.

More concrete modeling of early and present-day humans is manifest in the inventory of cosmic models discussed by Bethe Hagens in "'Venuses', turtles, and other hand-held cosmic models". Bolas, crystals, and the 'dymaxion' planetary grid, besides Venuses and turtles, situate the human in a space and a time, often with reference to an inner *and* outer space *and* time, using the body or its environment as a reference point. Hagens posits that classical geometric shapes and the body plans of living organisms served as mnemonic toys as well as shamanic tools to visually and tacitly implant cultural notions of the interconnection of human, earth, and cosmos. Furthermore, the early hominid worldview reconstructed by recourse to these models corresponds dramatically with the scientific constructs of R. Buckminster Fuller, also referenced in the article by C.W. Spinks.

This sweeping continuity from prehistory to futurology receives more focused treatment by Vernard Foley in "Toys in engineering

history: The role of scale models and miniaturization techniques". Foley presents evidence for the synergism of contrasts in scale between toys (especially small ones) and tools (particularly the larger prime-movers). Foley focuses on miniatures as models for larger constructions throughout technological history, mentioning the scalar reversal in molecular models. When models take on the mantle of prototype or stereotype, they behave differently than when they are themselves the coin of communication. The iconic simulacra deceive, because they fall short of their inspirations in precisely those features most crucial to their ultimate function. We also recognize that scale does not scale — that scale appears digital and quantitative, but behaves analogically, even in ordinary recipes. As prototype or stereotype, models figure in the anticipation, manufacture, and consumption of replicas, an interplay of great complexity in any field (Odum 1988). When differential production intersects with differential demise and these necessities in turn with chance, we observe the models taking on dynamic properties of their own. Shea Zellweger and Thomas A. Sebeok specifically propose a natural selection of models, but also recognize that models, as other systems, can manifest an intrinsic trajectory not always limited or enabled by extrinsic selection, at least not within the window of any particular observer.

Nonetheless, scale models, when deliberately designed, facilitate the fine-tuning of larger apparati. In addition, the leisure to think and tinker, to tool and toy and toil with ideas and objects, has as a by-product a host of inventions. Models back-cross, infect other models and our imagination, and reproduce with varying fidelity, rendering them at least as interesting as the plants and animals involved in codomestication. The notion of codomestication (Coppinger and Smith 1983), appears appropriate to describe the interdependency of humans and their models, tools, toys, and culture generally. Indeed, as Peirce suggests and as Myrdene Anderson later demonstrates with respect to so-called artificial life, models, tools, toys, and ideas can exhibit a life of their own, can take on the characteristics of mind.

Korzybski's metaphor of 'map and territory', to contrast model with modeled, has inspired An Painter's critical discussion of human in landscape, for which she brings in a third term: "Maps, territories, and mandalas". Science and literature provide many reminders of the necessary distinction between the map icon and the territory, between the datum index and the subject matter (following Chomsky), between the scaffolding index and the building (following Goethe),

and between the hologramic relata of medium and message (following McLuhan) and between mind and memory (following Pribram). Painter brings in Lewis Carroll and Carlos Castañeda to muse along with them about the ethics and aesthetics of the spirit of place.

Unlike the relatively recent systems uncovered and developed by Zellweger and Pazukhin, and in contrast with most of the exploratory, descriptive, and explanatory modeling of science, much of the modeling we do has been outfitted with notational conventions from the historic past. In "Notational systems: The interaction of model and content", Rachel B. Ramadhyani investigates the constraints obtaining with respect to the graphic representation of language, music, and dance. These constraints fall along a continuum depending on the relative interpenetration of meaning and behavior, for each of encoder and decoder, as also Goodman (1976) effectively demonstrates for the non-representation of the arts. Ramadhyani points out that notational conventions for these performance systems factor out the temporal dynamic, or represent it in successive slices. Interestingly, while most languages have some conventional graphic rendition, music notations are more recent, even more culturally impregnated, and geographically patchy, while dance notations continue to challenge human modeling virtuosity.

Sign of life and life of the sign

As noted by Sebeok and Deely later on, living processes constitute semiosis par excellence, with their self-organization, self-recognition, and self-reproduction. Taking life as a dissipative structure far from equilibrium, Jesper Hoffmeyer and Claus Emmeche reconsider the essential meaning of biological information in "Code-duality and the semiotics of nature". They read the recent history of biology as a cautionary tale, and sensibly conclude that a philosophically astute semiotic approach to the life sciences averts the reductionism in much contemporary theory and practice of biology. Consequently, distancing the classical paradigm obligates our appreciation of both symmetry and dissymmetry, equilibrium and disequilibrium, continuity and discontinuity.

Drawing on Max Delbruck and Marcel Florkin, among others, Mark Levinthal surveys "The use and misuse of metaphor in biology: Studies

of the semantics of molecular evolution". The modeling of microevolution, no less than of macroevolution, calls for balanced attention to diachronics and synchronics, so as not to muddy the interplay of structures and functions as they weave through genealogical, structurally-shaped homologies and ecological, functionally shaped analogies – the first largely enabled by genetic information, the second largely limited by environmental energy. Levinthal cites the recent (1986) work by D.R. Brooks and E.O. Wiley, *Evolution as Entropy: Towards a Unified Theory of Biology*, which also figures in the later chapter by Stanley N. Salthe.

Stanley N. Salthe's provocative "Kali theory" falls short of self-destruction, but does introduce the distinctions between the twin perspectives on self-organization, namely development and evolution. Related to this, Myrdene Anderson looks at the evolution and development of "The conduct of artificial life: A quest for artificial death?", as well as the evolution and development of artificial life itself. This recent twist on the scientific scene finds an interpretation in keeping with other themes of tools and toys, codomestication, and neoteny.

"Worlds and signs: Explicate and implicate order", by Walter A. Koch brings David Bohm's paradigm into greater semiotic focus. Koch arrives at this project from a long-time fascination with the relations obtaining between nature and culture, at all levels and in all manifestations. The thread is picked up by Floyd Merrell's "Model, world, semiotic reality", which likewise implodes all distinctions of science and literature. To round off the collection by transcending the state-of-the-art-craft-science, Robert de Beaugrande considers "Semiotics and control systems: Toward a non-classical model of communication". As many other contributors, de Beaugrande is convinced that the emerging paradigm of nonequilibrium dynamics and dissipative structures is pregnant with semiotic implications, and brings these to bear on communication through a modeling of interference patterns.

Communication and signification

One might argue that the modeling characteristic of living processes imbibes more of the indexical than the iconic, and that when either the iconic or the indexical model conventionalizes, as in language or culture, we can refer to the symbolic in modeling (Anderson 1988).

Mathematical modeling operates on any of these classes of relationships. The mutual impress between two or more dynamical systems – as between species and environment in natural-selection-enabled adaptation – partakes of the indexical because of the very temporal traces in phylogeny and ontogeny and because of the complementation leading to our inferential processes. The modeling of temporal systems may or may not capture iconically the essence of indexicality in the model(s) being modeled.

Thought, whether by means of algebra (CP 3.367ff), geometry (CP 4.447), logic (CP 4.447-4.448), resemblances (CP 2.281), diagrams (CP 2.282), or by pure imagery (CP 4.448), involves in some form or another, iconicity, Firstness. In fact, all communication is iconic. The only means of directly communicating ideas is through icons, and every indirect method of communication must be based on their use. From a semiotic perspective, then, icons play a key role in modeling, whether speaking of the object to be modeled or the source from which the model is to be derived. An icon refers to the entity it signifies by virtue of characters of its own which it possesses, and whether any such entity actually exists or not (CP 2.247).

In asking, “In what sense is language a primary modeling system?”, Thomas A. Sebeok considers the reciprocal relation between a system and its environment, and probes whether language is a ‘primary’, ‘secondary’, or further derivative modeling system. He reviews the most engaging of representations of sign processing, suggesting ultimately that human language systems enabling anthroposemiotics (dealt with in more detail by John Deely) must build upon the primary modeling systems of humans as an animal species. Consequently, human language corresponds to a secondary modeling system, and human culture to a tertiary modeling system.

While Sebeok examines the relation of language to other modeling systems, and the relation of speech to language, Rostislav Pazukhin attends to the relation of speech to writing, and of each as transubstantiations to an underlying language. He reminds us that actual speech is resistant to analysis through top-down segmentation or bottom-up combinatorics. Hence, we must call into question the validity of our theoretical construct of a phoneme, although universally enamored by linguists and perhaps thoroughly entrenched in our literature and pragmatics concerning language. Our dearly beloved phoneme may indeed be a back-propagation from our digitally segmented written form of language. This lesson concerns all instances of