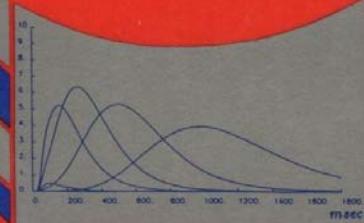
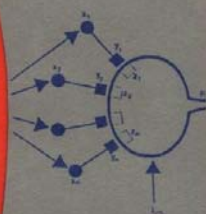
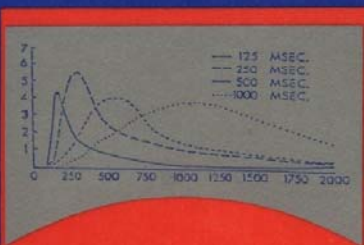


A Volume in the
QUANTITATIVE ANALYSES OF BEHAVIOR SERIES

**NEURAL
NETWORK
MODELS OF
CONDITIONING
AND
ACTION**



Michael L.
COMMONS

Stephen
GROSSBERG

John E. R.
STADDON



2-006-130-1

NEURAL NETWORK MODELS OF CONDITIONING AND ACTION

A Volume in the
Quantitative Analyses
of Behavior Series

Edited by

MICHAEL L. COMMONS
Harvard Medical School

STEPHEN GROSSBERG
Boston University

JOHN E. R. STADDON
Duke University



LAWRENCE ERLBAUM ASSOCIATES, PUBLISHERS
1991 Hillsdale, New Jersey Hove and London

Contents

About the Editors	xi
About the Contributors	xiii
Preface	
— <i>Michael L. Commons, Stephen Grossberg,</i> <i>and John E. R. Staddon</i>	xix

PART I. MODELS OF CLASSICAL CONDITIONING

Chapter 1	
Memory Function in Neural and Artificial Networks	
— <i>Daniel L. Alkon, Thomas P. Vogl, Kim T. Blackwell,</i> <i>and David Tam</i>	1
Chapter 2	
Empirically Derived Adaptive Elements and Networks Simulate Associative Learning	
— <i>Douglas A. Baxter, Dean V. Buonomano,</i> <i>Jennifer L. Raymond, David G. Cook, Frederick M. Kuenzi,</i> <i>Thomas J. Carew, and John H. Byrne</i>	13
Chapter 3	
Adaptive Synaptogenesis Can Complement Associative Potentiation/Depression	
— <i>William B. Levy and Costa M. Colbert</i>	53

Chapter 4
**A Neural Network Architecture for Pavlovian Conditioning:
Reinforcement, Attention, Forgetting, Timing**
—*Stephen Grossberg* 69

Chapter 5
**Simulations of Conditioned Perseveration and Novelty
Preference From Frontal Lobe Damage**
—*Daniel S. Levine and Paul S. Prueitt* 123

Chapter 6
**Neural Dynamics and Hippocampal Modulation of Classical
Conditioning**
—*Nestor A. Schmajuk and James J. DiCarlo* 149

Chapter 7
**Implementing Connectionist Algorithms for Classical
Conditioning in the Brain**
—*John W. Moore* 181

PART II. MODELS OF INSTRUMENTAL CONDITIONING

Chapter 8
Models of Acquisition and Preference
—*Michael L. Commons, Eric W. Bing, Charla C. Griffy,
and Edward J. Trudeau* 201

Chapter 9
A Connectionist Model of Timing
—*Russell M. Church and Hilary A. Broadbent* 225

Chapter 10
**A Connectionist Approach to Conditional Discriminations:
Learning, Short-Term Memory, and Attention**
—*William S. Maki and Adel M. Abunawass* 241

Chapter 11
On the Assignment-of-Credit Problem in Operant Learning
—*John E. R. Staddon and Y. Zhang* 279

Chapter 12	
Behavioral Diversity, Search and Stochastic Connectionist Systems	
— <i>Stephen José Hanson</i>	295
Author Index	345
Subject Index	353