

Contents

1. Analysis of Experiments and Model Identification	6
1.1. Equivalent events,	7
1.2. Response symmetry and complementary events,	9
1.3. Outcome symmetry,	11
1.4. The control of model events,	12
1.5. Contingent experiments and contingent events,	14
2. Axiomatics and Heuristics of Model Construction	15
2.1. Path-independent event effects,	16
2.2. Commutative events,	17
2.3. Repeated occurrence of a single event,	18
2.4. Combining-classes condition: Bush and Mosteller's linear-operator models,	19
2.5. Independence from irrelevant alternatives: Luce's beta response-strength model,	25
2.6. Urn schemes and explicit forms,	30
2.7. Event effects and their invariance,	36
2.8. Simplicity,	38
3. Deterministic and Continuous Approximations	39
3.1. Approximations for an urn model,	40
3.2. More on the expected-operator approximation,	43
3.3. Deterministic approximations for a model of operant conditioning,	47
4. Classification and Theoretical Comparison of Models	49
4.1. Comparison by transformation of the explicit formula,	50
4.2. Note on the classification of operators and recursive formulas,	56

4.3.	Implications of commutativity for responsiveness and asymptotic behavior,	56
4.4.	Commutativity and the asymptote in prediction experiments,	61
4.5.	Analysis of the explicit formula,	65
5.	Mathematical Methods for the Analysis of Models	75
5.1.	The Monte Carlo method,	76
5.2.	Indicator random variables,	77
5.3.	Conditional expectations,	78
5.4.	Conditional expectations and the development of functional equations,	81
5.5.	Difference equations,	83
5.6.	Solution of functional equations,	85
6.	Some Aspects of the Application and Testing of Learning Models	89
6.1.	Model properties: a model type as a subspace,	89
6.2.	The estimation problem,	93
6.3.	Individual differences,	99
6.4.	Testing a single model type,	102
6.5.	Comparative testing of models,	104
6.6.	Models as baselines and aids to inference,	106
6.7.	Testing model assumptions in isolation,	109
7.	Conclusion	116
	References	117