

Contents

Introduction: Agent-Based Computational Demography	1
<i>Francesco C. Billari, Fausta Ongaro and Alexia Prskawetz</i>	
1 Introduction: Demographers Are Almost Absent in a Flourishing Field of Research	1
2 The Gap Between Theory and Techniques in Demography	3
3 The Added Gains of Agent-Based Computational Demography	4
4 Difficulties and Challenges for Agent-Based Computational Demography .	6
5 Agent-Based Models in Demography: Examples in this Book	6
6 Discussion: The Potential Roles of Agent-Based Computational Demography	11
References	15
Data, Models, Theory and Reality: The Structure of Demographic Knowledge	19
<i>Thomas K. Burch</i>	
1 Introduction	19
2 The Methodology of Ansley J. Coale	22
3 Nathan Keyfitz on the Fruitfulness of Abstract Modelling	27
4 A Model-Based View of Science	28
5 Elements of Science	32
6 Assessing Scientific Knowledge	35
7 Coda: On the Dangers of Dichotomies	37
References	39
The Role of Agent-Based Modelling in Demographic Explanation	41
<i>Edmund Chattoe</i>	
1 Introduction	41
2 The Problem of Thin Social Processes	42
3 The Problem of Relating Existing Theories to ABM	46
4 Representing Social Context	47
5 Representing Cognitive Complexity	48
6 Collecting Appropriate Data	51
7 Conclusion	52
References	53
Diffusion Processes in Demographic Transitions: A Prospect on Using Multi Agent Simulation to Explore the Role of Cognitive Strategies and Social Interactions	55
<i>Wander Jager and Marco A. Janssen</i>	
1 Introduction	55
2 Behavioural Rules in MAS	58

3	Decision Making	59
4	The Consumat Approach	62
5	A Possible Application of the Consumat Approach: The Diffusion of Contraceptives	64
6	Prospects for Applications of the Consumat Approach in Demographic Research Questions	67
7	Conclusions	69
	References	70

The Collapse of the Berlin Wall:

Simulating State-Level East to West German Migration Patterns 73

Frank Heiland

1	Introduction	73
2	Historical Background	74
3	Evidence on East to West German Migration	75
4	Theoretical Framework	76
5	Data and Stylized Facts	77
6	An Agent-Based Simulation Model	82
7	Conclusions	92
	References	93

Agent-Based Modeling of Householders' Migration Behavior and Its Consequences 97

Itzhak Benenson, Itzhak Omer and Erez Hatna

1	Introduction	97
2	Agent-Based Modelling as a Tool for Analysis of Complex Multi-Agent Systems	98
3	Abstract Models of Residential Migration	102
4	A Real-World Agent-Based Model of Residential Choice and Migration ..	103
5	Discussion	112
6	Conclusions	112
	References	113

Population-Wide Marriage Patterns Produced by Individual Mate-Search Heuristics 117

Peter M. Todd and Francesco C. Billari

1	Introduction	117
2	The Demographic Patterns of Age at Marriage	118
3	Modeling Sequential Search Processes	123
4	Implications and Conclusions	135
	References	136

On the Cultural Evolution of Age-at-Marriage Norms 139

Francesco C. Billari, Alexia Prskawetz and Johannes Fürnkranz

1	Introduction	139
2	Background	140

3	An Agent-Based Model	143
4	Results and Discussion	146
5	Summary and Prospects for Future Research	155
	References	156

**Bringing Behavior Back into Micro-Simulation: Feedback Mechanisms
in Demographic Models** 159

Mike Murphy

1	Introduction	159
2	Data and Methods	164
3	Results	166
4	Summary of Findings	172
	References	173

**Consequences of Mortality Crises in Pre-Modern European Towns:
A Multiagent-Based Simulation Approach** 175

Ulf Christian Ewert, Mathias Roehl and Adelinde M. Uhrmacher

1	Introduction	175
2	James	177
3	Implementation in James	177
4	First Experiments and Some Preliminary Results	185
5	Conclusions and Future Prospects of the Model	193
	References	194

Agents, Hierarchies and Sustainability 197

Andreas König, Michael Möhring and Klaus G. Troitzsch

1	Setting: A Sugarscape-Like Grid	197
2	Agents: Overview	200
3	Experiments	206
4	Conclusion	209
	References	210