Piatra . Institute

Introduction to Doxonomics

Toward a Science of
How Power Shapes Belief

2026

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Toward a Science of How Power Shapes Belief

> The ideas of the ruling class are in every epoch the ruling ideas: i.e., the class which is the ruling material force of society is at the same time its ruling intellectual force.
>
> Karl Marx & Friedrich Engels, *The German Ideology* (1846)

2026

Contents

Contents i

Preface xxi

Notation xxiii

I Foundations 1

1 What Is Doxonomics? 3
- 1.1 The Object of Study . . . 4
- 1.2 The Core Conversion Problem . . . 5
- 1.3 The Belief Production Chain . . . 6
- 1.4 What Doxonomics Is Not . . . 8
- 1.5 Scope and Limits . . . 8
- 1.6 Neighboring Fields and the Distinctive Contribution . . . 9
- 1.7 The Structure of This Book . . . 9
- 1.8 Notes and References . . . 10
- 1.9 Exercises . . . 11

2 The Ontology of Public Belief 13
- 2.1 Opinion, Belief, Ideology, Common Sense, Doxa . . . 13
- 2.2 Private Belief and Public Expression . . . 16
- 2.3 Anthropological Regimes . . . 17
- 2.4 Beyond Propositions: A Layered Ontology . . . 18
- 2.5 Truth, Power, and the Scope of Doxonomic Analysis . . . 20
- 2.6 Belief as Probability Distribution . . . 21
- 2.7 Operationalizing the Invisible: How to Detect Doxa . . . 22
- 2.8 Notes and References . . . 23
- 2.9 Exercises . . . 24

3 A Brief Prehistory of Doxonomics 25
- 3.1 Sophists and the Market for Persuasion . . . 25

3.2 Hobbes, Mandeville, and the Construction of Selfish Anthropology . . . 26
3.3 Marx: Ideology as Material Production . . . 27
3.4 Gramsci: Hegemony . . . 27
3.5 Lippmann and Dewey: The Public Opinion Debate . . . 28
3.6 Bernays: Engineering Consent . . . 29
3.7 The Frankfurt School: Culture Industry . . . 29
3.8 Foucault: Discourse, Power, and the Production of Truth . . . 30
3.9 Bourdieu: Symbolic Power, Doxa, and Reproduction . . . 31
3.10 Herman and Chomsky: The Propaganda Model . . . 31
3.11 Colonial Knowledge Production . . . 32
3.12 The Digital Turn: Platforms as Doxonomic Infrastructure . . . 33
3.13 Synthesis: What Doxonomics Inherits . . . 33
3.14 A Timeline . . . 34
3.15 Notes and References . . . 35
3.16 Exercises . . . 35

4 Core Units of Analysis **37**
4.1 Agents . . . 37
4.2 Institutions as Belief-Processing Functions . . . 39
4.3 Channels . . . 40
4.4 Budgets as Resource Allocation Vectors . . . 42
4.5 Narratives . . . 43
4.6 Audiences and Prior Distributions . . . 44
4.7 Feedback Loops . . . 45
4.8 Assembling the Units: A Toy Model . . . 46
4.9 Notes and References . . . 47
4.10 Exercises . . . 47

5 The Belief Production Chain **49**
5.1 The Chain as Operator Composition . . . 49
5.2 Stage 1: Funding Allocation . . . 50
5.3 Stage 2: Institutional Processing . . . 51
5.4 Stage 3: Circulation . . . 52
5.5 Stage 4: Internalization . . . 53
5.5.1 The Bayesian Baseline . . . 53
5.5.2 Beyond Bayes: How Real People Internalize . . . 54
5.6 Stage 5: Behavioral Consequence . . . 55
5.7 Stage 6: Reproduction . . . 55
5.8 Generational Reproduction as a Fixed-Point Problem . . . 56
5.9 Comparison with Input-Output Models . . . 57
5.10 Where Chains Break: Failure Modes . . . 58
5.11 The Full Chain Diagram . . . 58
5.12 Notes and References . . . 58

5.13 Exercises 59

II Concepts and Models **63**

6 Epistemic Capital **65**
6.1 Definition and Structure 65
6.2 Conversion Functions 67
6.3 Epistemic Rents 68
6.4 Credibility Destruction 69
6.5 Interaction Effects Between Capital Types 70
6.6 Epistemic Capital Inequality 70
6.7 The Digital Disruption of Epistemic Capital 71
6.8 The Credibility Market 72
6.9 Notes and References 72
6.10 Exercises 73

7 Narrative Infrastructure **75**
7.1 Infrastructure as Transformation Network 75
7.2 Institutional Types and Their Infrastructure Roles 76
7.3 Throughput and Capacity 78
7.4 Network Topology and Structural Advantage 79
7.5 Concentration Metrics 80
7.6 Infrastructure Resilience and Vulnerability 81
7.7 Infrastructure Construction and Path Dependence 82
7.8 Platform Infrastructure: The Algorithmic Layer 83
7.9 Notes and References 83
7.10 Exercises 84

8 Common-Sense Capture **87**
8.1 Capture as Phase Transition 87
8.2 Threshold Models 88
8.3 The Doxonomic Investment Needed for Capture 90
8.4 Mechanisms of Capture 90
8.4.1 Institutional Saturation 90
8.4.2 Crowding Out Alternatives 91
8.4.3 Normalization Through Repetition 91
8.4.4 Social Proof Cascades 91
8.5 Path Dependence and Lock-In 92
8.6 Saturation and Diminishing Returns 93
8.7 Detecting Capture: Empirical Signatures 94
8.8 Historical Case: The Capture of “Markets Know Best” 94
8.9 Escape from Capture 95
8.10 Notes and References 96

8.11 Exercises 96

9 Doxonomic Power **99**
9.1 Four Dimensions of Power 99
9.2 Distributed Coordination Without Conspiracy 101
9.3 Power as Prior-Setting 103
9.4 The Production of Ignorance 104
9.5 Epistemic Injustice as Doxonomic Power 105
9.6 Measuring Doxonomic Power 106
9.7 Power and Resistance 107
9.8 Notes and References 107
9.9 Exercises 108

10 The Economics of Belief Production **111**
10.1 Cost Functions for Narrative Production 111
10.2 Ideological Return on Investment 113
10.3 The Market for Belief: Supply and Demand 114
10.4 Belief as Public Good or Public Bad 115
10.5 Doxonomic Pigouvian Correction 116
10.6 Epistemic Herfindahl Index 117
10.7 Subsidy Structures and Hidden Transfers 118
10.8 The Doxonomic Balance Sheet 118
10.9 Notes and References 119
10.10 Exercises 120

11 Formal Models of Doxonomic Systems **121**
11.1 Stock-and-Flow Models 122
11.1.1 Stability Analysis 122
11.1.2 Bifurcation Under Changing Funding 123
11.2 Epidemiological Diffusion Models 124
11.2.1 Endemic Equilibrium 124
11.2.2 The SIRV Model: Inoculation 125
11.3 Bayesian Updating Under Unequal Exposure 126
11.4 Cascade Models 127
11.5 Competitive Belief Dynamics 128
11.5.1 Equilibrium Analysis 128
11.6 Agent-Based Models 129
11.7 Model Comparison and Selection 130
11.8 Notes and References 131
11.9 Exercises 132

12 Contradiction, Fragmentation, and Sheaf-Like Coherence **135**
12.1 Local Belief Systems 136
12.2 Sheaf-Theoretic Framework 137

12.3 Ideology as Obstruction Management . . . 138
12.4 Managed Contradiction . . . 139
12.5 Fragmented Publics . . . 140
12.6 The Dynamics of Coherence and Fragmentation . . . 141
12.7 Coherence, Power, and Critique . . . 142
12.8 Notes and References . . . 142
12.9 Exercises . . . 143

III Methods **147**

13 Doxometric Measurement **149**
13.1 What Counts as a Measurable Belief? . . . 149
13.2 Indicators and Proxies . . . 150
13.3 Measurement Bias and Correction . . . 151
13.4 Latent Variable Models . . . 152
13.4.1 Item Response Theory . . . 153
13.5 Composite Indices of Belief Dominance . . . 154
13.6 Measuring Institutional Embeddedness . . . 154
13.7 Measuring Doxonomic Change Over Time . . . 155
13.8 Notes and References . . . 156
13.9 Exercises . . . 156

14 Belief-Flow Accounting **159**
14.1 The Accounting Framework . . . 159
14.2 Source Identification . . . 160
14.2.1 Data Sources for Source Identification . . . 161
14.3 Ideological Input-Output Tables . . . 162
14.4 Accounting Identities . . . 163
14.5 Uncertainty in Doxonomic Accounting . . . 164
14.6 A Worked Example: Accounting for Austerity Belief . . . 164
14.7 Accounting for Non-Monetary Flows . . . 165
14.8 Notes and References . . . 166
14.9 Exercises . . . 166

15 Network Analysis of Belief Systems **169**
15.1 Doxonomic Networks . . . 169
15.2 Centrality Measures . . . 170
15.2.1 Multiple Centrality Measures . . . 171
15.3 Community Detection . . . 172
15.4 Brokerage . . . 173
15.5 Example: A Donor-Institution Network . . . 174
15.6 Spectral Analysis of Doxonomic Networks . . . 174
15.7 Temporal Network Dynamics . . . 175

15.8 Network Resilience and Attack Vulnerability . . . 176
15.9 Practical Network Reconstruction . . . 176
15.10 Notes and References . . . 177
15.11 Exercises . . . 177

16 Causal Inference in Doxonomics **179**
16.1 The Potential Outcomes Framework . . . 179
16.1.1 Basic setup . . . 179
16.1.2 Conditional treatment effects . . . 180
16.1.3 Worked example: estimating a think-tank effect . . . 181
16.2 Natural Experiments in Doxonomic Settings . . . 181
16.2.1 Media market boundaries . . . 181
16.2.2 Outlet entry and exit . . . 182
16.2.3 Platform algorithm changes . . . 182
16.2.4 Policy shocks . . . 182
16.3 Difference-in-Differences . . . 183
16.3.1 Basic design . . . 183
16.3.2 Parallel trends and pre-treatment tests . . . 183
16.3.3 Staggered adoption and modern DiD . . . 184
16.3.4 Worked example: think-tank regional entry . . . 184
16.4 Instrumental Variables . . . 185
16.4.1 The doxonomic endogeneity problem . . . 185
16.4.2 Candidate instruments . . . 185
16.4.3 Two-stage least squares . . . 186
16.4.4 Worked example: channel position instrument . . . 186
16.5 Causal Directed Acyclic Graphs . . . 187
16.5.1 The core doxonomic DAG . . . 187
16.5.2 An expanded DAG . . . 187
16.5.3 Identification via d-separation . . . 188
16.6 Synthetic Control Methods . . . 188
16.6.1 The setup . . . 188
16.6.2 Doxonomic applications . . . 189
16.6.3 Worked example: advertising ban . . . 189
16.7 Regression Discontinuity . . . 189
16.7.1 Sharp and fuzzy designs . . . 189
16.7.2 Doxonomic RD settings . . . 190
16.8 Interference and Spillovers . . . 190
16.8.1 Why SUTVA fails in doxonomics . . . 190
16.8.2 Direct and indirect effects . . . 191
16.8.3 Cluster randomized designs . . . 191
16.9 Sensitivity Analysis and Robustness . . . 191
16.9.1 Omitted variable bias bounds . . . 191
16.9.2 Rosenbaum bounds . . . 192
16.9.3 Reporting standards . . . 192

16.10 Doxonomic-Specific Identification Challenges . . . 192
16.10.1 Strategic obscuration . . . 192
16.10.2 Belief measurement . . . 193
16.10.3 Long causal chains . . . 193
16.10.4 Feedback and general equilibrium . . . 193
16.11 Notes and References . . . 193
16.12 Exercises . . . 194

17 Text, Media, and Discourse Analysis 197
17.1 Corpus Construction . . . 197
17.1.1 Definition and principles . . . 197
17.1.2 Sampling and bias . . . 198
17.1.3 Worked example: constructing a climate-discourse corpus . . . 199
17.2 Framing Analysis . . . 199
17.2.1 Formal framework . . . 199
17.2.2 Computational frame detection . . . 200
17.2.3 Frame prevalence and institutional funding . . . 200
17.3 Topic Models . . . 201
17.3.1 Latent Dirichlet Allocation . . . 201
17.3.2 Structural topic models . . . 201
17.3.3 Dynamic topic models . . . 202
17.3.4 Choosing K and validation . . . 202
17.4 Sentiment, Stance, and Moral Foundations . . . 202
17.4.1 Beyond sentiment . . . 202
17.4.2 Moral foundations in narrative . . . 203
17.4.3 Measuring narrative concentration across moral dimensions . . . 203
17.5 Semantic Drift and Concept Capture . . . 203
17.5.1 Measuring drift . . . 203
17.5.2 Concept capture as accelerated drift . . . 204
17.5.3 Contested concepts and embedding neighborhoods . . . 204
17.6 Information-Theoretic Measures . . . 205
17.6.1 Narrative entropy . . . 205
17.6.2 Relative entropy and narrative distance . . . 205
17.6.3 Mutual information between funding and framing . . . 206
17.6.4 Worked example: entropy decline in economic discourse 206
17.7 Network-Based Discourse Analysis . . . 206
17.7.1 Citation and co-occurrence networks . . . 206
17.7.2 Discourse community detection . . . 207
17.7.3 Narrative diffusion tracing . . . 207
17.8 Computational Tools and Practical Workflow . . . 207
17.8.1 A doxonomic text analysis pipeline . . . 207
17.8.2 Embedding models for doxonomic analysis . . . 208

17.9 Limitations and Epistemological Cautions 208
17.9.1 Text is not belief 208
17.9.2 The interpretation problem 209
17.9.3 Reflexivity 209
17.10 Notes and References 209
17.11 Exercises 209

18 Historical and Archival Methods **213**
18.1 Genealogy of Concepts 213
18.1.1 Definition and scope 213
18.1.2 Genealogy vs. intellectual history 214
18.1.3 Constructing a genealogy: method 214
18.1.4 Worked example: the genealogy of "markets are efficient" 215
18.2 Institutional Archives 216
18.2.1 Types of archival sources 216
18.2.2 Archival methodology for doxonomics 216
18.2.3 Source criticism for doxonomic archives 217
18.2.4 Worked example: the tobacco documents 217
18.3 Long-Duration Narrative Change 218
18.3.1 Periodization of belief regimes 218
18.3.2 A periodization of economic common sense, 1870–2020 218
18.3.3 Temporal scales in doxonomic change 219
18.4 Comparative-Historical Methods 220
18.4.1 Mill's methods and doxonomic comparison 220
18.4.2 Process tracing 220
18.4.3 Counterfactual reasoning 221
18.5 Integrating Historical and Computational Evidence 222
18.5.1 The complementarity principle 222
18.5.2 Mixed-methods research designs 222
18.6 Oral History and Elite Interviews 223
18.6.1 Interview design for doxonomic research 223
18.6.2 Snowball sampling through doxonomic networks . . . 223
18.7 Ethical Considerations in Doxonomic Historical Research . . . 224
18.7.1 The politics of genealogy 224
18.7.2 Access and power asymmetries 224
18.8 Notes and References 224
18.9 Exercises 225

19 Experimental Doxonomics **227**
19.1 Cooperation Games as Belief Measurement 227
19.1.1 The behavioral proxy strategy 227
19.1.2 Baseline findings 228
19.1.3 Game selection 228

19.1.4 The economics education effect . . . 229
19.2 Priming and Framing Experiments . . . 229
19.2.1 Basic design . . . 229
19.2.2 Dose-response designs . . . 230
19.2.3 Source credibility manipulation . . . 230
19.2.4 Persistence and decay . . . 230
19.3 Norm Perception Experiments . . . 231
19.3.1 The norm channel . . . 231
19.3.2 Measuring the norm channel . . . 232
19.4 Field Experiments . . . 232
19.4.1 Why laboratory results may not generalize . . . 232
19.4.2 Media field experiments . . . 233
19.4.3 Educational field experiments . . . 233
19.4.4 Information correction experiments . . . 234
19.5 Survey Experiments . . . 234
19.5.1 Conjoint designs for doxonomic attributes . . . 234
19.5.2 List experiments for sensitive beliefs . . . 235
19.6 Online and Platform Experiments . . . 235
19.6.1 Advantages and limitations . . . 235
19.6.2 A/B testing as doxonomic evidence . . . 236
19.6.3 Researcher-platform collaborations . . . 236
19.7 Power Analysis and Sample Size . . . 236
19.7.1 Doxonomic effect sizes . . . 236
19.7.2 Pre-registration . . . 237
19.8 Ethical Constraints and Institutional Review . . . 237
19.8.1 The harm asymmetry . . . 237
19.8.2 Specific ethical concerns . . . 237
19.8.3 Mitigation strategies . . . 238
19.9 Replication and Meta-Analysis . . . 238
19.9.1 The replication crisis and doxonomic experiments . . . 238
19.9.2 Meta-analytic synthesis . . . 238
19.10 Notes and References . . . 239
19.11 Exercises . . . 239

20 Model Validation and Epistemic Humility 241
20.1 Uncertainty Quantification . . . 241
20.1.1 The uncertainty imperative . . . 241
20.1.2 Frequentist and Bayesian frameworks . . . 242
20.1.3 Propagating uncertainty through the doxonomic chain 242
20.1.4 Reporting standards . . . 243
20.2 Overfitting and the Ideological Hazard . . . 243
20.2.1 The problem . . . 243
20.2.2 The ideological hazard . . . 244
20.3 Out-of-Sample Prediction . . . 244

20.3.1 The prediction test . . . 244
20.3.2 Temporal out-of-sample tests . . . 245
20.3.3 Cross-national out-of-sample tests . . . 245
20.4 Sensitivity Analysis . . . 245
20.4.1 Rosenbaum bounds revisited . . . 245
20.4.2 The Oster test . . . 246
20.4.3 Placebo tests . . . 246
20.5 Bayesian Model Comparison . . . 247
20.5.1 The model comparison problem . . . 247
20.5.2 Comparing doxonomic and non-doxonomic models . . . 247
20.5.3 Model averaging . . . 248
20.6 Triangulation . . . 248
20.6.1 The convergence criterion . . . 248
20.6.2 Formal triangulation assessment . . . 249
20.7 Falsifiability and Degenerating Research Programs . . . 249
20.7.1 What would falsify doxonomics? . . . 249
20.7.2 Lakatos and degenerating programs . . . 250
20.8 Epistemic Humility in Practice . . . 250
20.8.1 The humility checklist . . . 250
20.8.2 Graduated confidence language . . . 251
20.8.3 The symmetry obligation . . . 251
20.9 Common Pitfalls and How to Avoid Them . . . 252
20.10 Notes and References . . . 252
20.11 Exercises . . . 253

IV Domains of Application 257

21 Human Nature as a Managed Narrative 259
21.1 The Claim and the Evidence . . . 260
21.1.1 The dominant anthropological regime . . . 260
21.1.2 What the experimental evidence actually shows . . . 260
21.2 The Institutional Genealogy of Homo Economicus . . . 261
21.2.1 Intellectual precursors (1600–1900) . . . 261
21.2.2 Formalization (1900–1960) . . . 262
21.2.3 Institutional build-out (1960–2000) . . . 262
21.3 The Education Channel . . . 263
21.3.1 Economics as doxonomic delivery mechanism . . . 263
21.3.2 The Frank-Gilovich-Regan finding . . . 264
21.3.3 What textbooks teach vs. what the evidence says . . . 265
21.4 Media and Popular Culture . . . 265
21.5 The Self-Fulfilling Prophecy . . . 266
21.5.1 The mechanism . . . 266
21.5.2 Multiple equilibria . . . 267

21.5.3 The doxonomic trap . . . 267
21.6 Affect, Precision, and the Moral Basin . . . 268
21.6.1 Feelings as dashboards, not verdicts . . . 268
21.6.2 A minimal state space . . . 269
21.6.3 Doxonomic amplification of D . . . 269
21.6.4 Hysteresis and the cost of exit . . . 270
21.7 The Policy Feedback Loop . . . 271
21.8 Two Competing Regimes: A Formal Model . . . 271
21.9 Counter-Narratives and Their Institutional Base . . . 272
21.10 Cross-Cultural Comparison . . . 273
21.11 Notes and References . . . 274
21.12 Exercises . . . 274

22 Meritocracy **277**
22.1 The Meritocratic Belief System . . . 277
22.1.1 Structure of the regime . . . 277
22.1.2 The empirical record . . . 278
22.1.3 The psychological function . . . 278
22.2 Institutional Repetition . . . 279
22.2.1 Education . . . 279
22.2.2 Corporate culture . . . 279
22.2.3 Media . . . 279
22.2.4 Policy . . . 280
22.2.5 Self-help industry . . . 280
22.3 Credential Systems as Epistemic Capital Laundering . . . 281
22.3.1 The laundering mechanism . . . 281
22.3.2 Decomposing credentials . . . 281
22.3.3 The credibility premium of credentials . . . 281
22.4 A Formal Model of Meritocratic Belief . . . 282
22.4.1 Belief as a function of investment and visibility . . . 282
22.4.2 The legitimation cost of inequality . . . 282
22.4.3 Dynamic model with inequality feedback . . . 283
22.5 The Doxonomic Genealogy of Meritocracy . . . 283
22.5.1 Origins of the concept . . . 283
22.5.2 Institutional genealogy . . . 283
22.6 Negative Cases: When Meritocratic Belief Fails . . . 284
22.7 Racial and Gender Dimensions . . . 285
22.7.1 Racial meritocracy gap . . . 285
22.7.2 The “model minority” function . . . 285
22.7.3 Gender and the “choice” narrative . . . 286
22.8 Comparative Doxonomics of Meritocracy . . . 286
22.9 Notes and References . . . 286
22.10 Exercises . . . 287

23 Consumerism and Manufactured Desire **289**
23.1 Advertising as Doxonomic Investment 290
23.1.1 Scale and structure 290
23.1.2 The dual product 290
23.2 The Desire Production Function 291
23.2.1 Basic model 291
23.2.2 The hedonic treadmill 291
23.2.3 Worked example: the smartphone cycle 292
23.3 Consumption as Anthropological Regime 292
23.3.1 The consumerist belief system 292
23.3.2 The historical construction 293
23.4 The Political Economy of Attention 294
23.4.1 Attention as the scarce resource 294
23.4.2 The attention tax 294
23.5 Consumerism and Other Doxonomic Regimes 295
23.5.1 Consumerism reinforces the selfishness regime 295
23.5.2 Consumerism as political quietism 295
23.5.3 Green consumerism as doxonomic containment . . . 295
23.6 Resistance and Counter-Narratives 296
23.6.1 Anti-consumerist movements 296
23.6.2 The funding asymmetry 296
23.7 Subjective Well-Being Evidence 297
23.7.1 The Easterlin paradox 297
23.7.2 What does produce well-being? 297
23.8 Notes and References 297
23.9 Exercises 298

24 Inequality and Legitimacy **301**
24.1 The Legitimation Problem 301
24.1.1 Why legitimation is necessary 301
24.1.2 The legitimation function 302
24.1.3 The escalating cost of legitimation 303
24.2 The Legitimation Repertoire 303
24.2.1 The wealth-virtue association 303
24.2.2 Trickle-down narratives 304
24.2.3 Aspirational narratives 304
24.2.4 Blame narratives 305
24.3 The Political Economy of Legitimation 305
24.3.1 Who funds legitimation? 305
24.3.2 Demand-side factors 306
24.4 Legitimation Failure and Crisis 306
24.4.1 When legitimation breaks down 306
24.4.2 The 2008–present legitimation crisis 307
24.4.3 A model of legitimation dynamics 308

24.5 Inequality, Race, and Compound Legitimation 308
24.6 Comparative Legitimation Regimes 309
24.7 Notes and References 309
24.8 Exercises 310

25 Race, Coloniality, and Gender as Doxonomic Systems 313
25.1 Race as Manufactured Social Ontology 313
25.1.1 Definition and mechanism 313
25.1.2 The institutional genealogy of scientific racism 314
25.1.3 The racial belief production model 315
25.1.4 The post-civil-rights transformation 316
25.2 Colonial Civilizational Narratives 316
25.2.1 Colonialism as doxonomic operation 316
25.2.2 Coloniality after colonialism 317
25.2.3 Epistemic violence and knowledge erasure 317
25.3 Gender as Doxonomic Construction 318
25.3.1 The gender regime 318
25.3.2 The distinctive features of gender doxonomics 318
25.3.3 The gender belief production chain 319
25.3.4 Feminist counter-doxonomics 319
25.4 Intersections and Compound Systems 320
25.4.1 The interaction structure 320
25.4.2 Sheaf-theoretic intersectionality 320
25.5 Alternative and Complementary Explanations 321
25.6 Limitations of the Doxonomic Framework for Identity Systems 322
25.6.1 What the framework captures 322
25.6.2 What it risks missing 322
25.7 Notes and References 323
25.8 Exercises 323

26 Austerity, Scarcity, and Fiscal Morality 325
26.1 The Household Metaphor 326
26.1.1 Definition and mechanism 326
26.1.2 The moral dimension 326
26.1.3 Institutional amplification 326
26.2 The Doxonomic Genealogy of Austerity 327
26.2.1 The classical foundation 327
26.2.2 The institutional build-out 327
26.3 Academic Credibility Laundering 328
26.3.1 The Reinhart-Rogoff episode 328
26.3.2 The general pattern 329
26.4 Crisis as Narrative Opportunity 329
26.4.1 The shock doctrine model 329
26.4.2 Narrative preparedness 330

26.5 The 2008–2013 Austerity Turn: A Detailed Case Study 330
26.5.1 Phase 1: Crisis narrative (2008–2009) 330
26.5.2 Phase 2: Reframing (2009–2010) 330
26.5.3 Phase 3: Normalization (2010–2013) 331
26.5.4 Phase 4: Partial narrative erosion (2013–2020) 331
26.6 A Formal Model of Fiscal Belief 332
26.7 Distributional Analysis 332
26.7.1 Who benefits from the austerity narrative? 332
26.7.2 The Greek case 333
26.8 Negative Cases and Counter-Narratives 333
26.8.1 Iceland: referendum against austerity 333
26.8.2 Latin American heterodoxy 334
26.8.3 Modern Monetary Theory 334
26.9 Media Framing of Fiscal Policy 334
26.9.1 Content analysis evidence 334
26.10 Notes and References 335
26.11 Exercises 335

27 Work, Discipline, and the Productive Self 339
27.1 The Work Ethic Regime 339
27.1.1 Definition 339
27.1.2 Historical genealogy 340
27.2 Labor Discipline as Internalized Belief 341
27.2.1 The model 341
27.2.2 Self-exploitation 341
27.3 Hustle Culture and the Entrepreneurial Self 342
27.3.1 The narrative 342
27.3.2 Institutional infrastructure 342
27.3.3 The doxonomic function 343
27.4 Precarity and the Normalization of Insecurity 343
27.4.1 The precariat 343
27.4.2 Who benefits? 344
27.5 The “Do What You Love” Ideology 344
27.6 Counter-Narratives and Resistance 344
27.6.1 The right to rest 344
27.6.2 Alternative explanations for overwork 345
27.6.3 The funding asymmetry 345
27.7 Cross-Cultural Variation 345
27.8 Notes and References 346
27.9 Exercises 346

28 Nation, Civilization, and Collective Myth 349
28.1 National Narrative as Doxonomic Product 349
28.1.1 The structure of national myth 349

28.1.2 The myth maintenance model . . . 350
28.2 The Institutional Infrastructure of National Identity . . . 351
28.2.1 Education . . . 351
28.2.2 Military and security institutions . . . 351
28.2.3 State media and public broadcasting . . . 351
28.2.4 Monuments, museums, and public space . . . 352
28.3 Historical Memory Management . . . 352
28.3.1 Selection and omission . . . 352
28.3.2 Contested memory . . . 353
28.4 Civilizational Narratives . . . 353
28.5 National Myth and Economic Interest . . . 354
28.6 Myth Fracture and Reconstruction . . . 355
28.6.1 When myths break . . . 355
28.6.2 Myth reconstruction . . . 355
28.7 Notes and References . . . 355
28.8 Exercises . . . 356

29 Technology, Inevitability, and the Future 359
29.1 Technological Determinism as Doxa . . . 359
29.1.1 The belief . . . 359
29.1.2 The institutional genealogy . . . 360
29.2 Innovation as Legitimating Discourse . . . 361
29.2.1 The innovation imperative . . . 361
29.2.2 Who funds the innovation discourse? . . . 361
29.3 Platform Ideology . . . 361
29.3.1 Platforms as doxonomic infrastructure . . . 361
29.3.2 Engagement optimization and narrative entropy . . . 362
29.3.3 Surveillance capitalism . . . 362
29.4 AI Narratives . . . 363
29.4.1 The “AI will change everything” narrative . . . 363
29.4.2 What the narratives suppress . . . 363
29.5 The Politics of Inevitability . . . 364
29.5.1 TINA as doxonomic product . . . 364
29.5.2 Alternative explanations for technological dominance 364
29.5.3 The doxonomic structure of inevitability . . . 365
29.6 Counter-Narratives: Technology as Social Choice . . . 365
29.6.1 The STS tradition . . . 365
29.6.2 Democratic technology governance . . . 366
29.6.3 The institutional gap . . . 366
29.7 Notes and References . . . 366
29.8 Exercises . . . 366

30 Crisis Doxonomics 369
30.1 Crisis as Phase Transition . . . 369

30.1.1 The acceleration model . . . 369
30.1.2 Phase transition analogy . . . 370
30.2 Fear as Amplifier . . . 371
30.2.1 Credibility weighting under threat . . . 371
30.2.2 The rally-around-the-flag effect . . . 371
30.2.3 Fear and simplification . . . 372
30.3 The Overton Window . . . 372
30.3.1 Definition and dynamics . . . 372
30.3.2 Crisis-induced window shifts . . . 372
30.3.3 The window-capture race . . . 373
30.4 Narrative Vacuum and Competition . . . 373
30.4.1 The vacuum period . . . 373
30.4.2 The game-theoretic structure . . . 374
30.5 Case Studies in Crisis Doxonomics . . . 374
30.5.1 The 2008 financial crisis (reprise) . . . 374
30.5.2 COVID-19 pandemic . . . 375
30.5.3 Climate crisis: slow-motion doxonomics . . . 375
30.6 Doxonomic Preparedness . . . 376
30.6.1 The preparedness framework . . . 376
30.6.2 Asymmetric preparedness . . . 376
30.7 Post-Crisis Consolidation . . . 377
30.7.1 The window of vulnerability . . . 377
30.7.2 Lock-in mechanisms . . . 377
30.8 Notes and References . . . 377
30.9 Exercises . . . 378

V Resistance, Repair, and Reconstruction 383

31 How Belief Regimes Fracture 385
31.1 Regime Fracture as Bifurcation . . . 385
31.1.1 The formal model . . . 385
31.1.2 The critical stress threshold . . . 386
31.1.3 The fragility-resilience spectrum . . . 386
31.2 Sources of Stress . . . 386
31.2.1 Contradiction accumulation . . . 387
31.2.2 Credibility collapse . . . 387
31.2.3 Economic shocks . . . 388
31.2.4 Generational turnover . . . 388
31.2.5 Memetic overload . . . 389
31.3 Fracture Dynamics . . . 389
31.3.1 Slow accumulation, fast collapse . . . 389
31.3.2 Partial vs. complete fracture . . . 389
31.3.3 What fills the vacuum? . . . 390

31.4 Historical Case Studies . . . 390
31.4.1 The fall of Soviet communism (1989–91) . . . 390
31.4.2 The #MeToo fracture (2017–) . . . 391
31.5 Regime Resilience and Repair . . . 391
31.5.1 Repair mechanisms . . . 391
31.5.2 The resilience paradox . . . 391
31.6 Notes and References . . . 392
31.7 Exercises . . . 392

32 Counter-Doxonomic Strategies **395**
32.1 The Counter-Doxonomic Challenge . . . 395
32.1.1 The fundamental asymmetry . . . 395
32.1.2 Sources of asymmetric advantage . . . 396
32.2 Alternative Institutions . . . 396
32.2.1 Building parallel infrastructure . . . 396
32.2.2 Institution design principles . . . 397
32.3 Pedagogical Interventions . . . 398
32.3.1 Critical pedagogy . . . 398
32.3.2 Media literacy as counter-doxonomics . . . 398
32.3.3 Doxonomic literacy . . . 398
32.4 Narrative Inoculation . . . 399
32.4.1 The inoculation model . . . 399
32.4.2 Practical inoculation design . . . 399
32.5 Optimal Allocation of Counter-Resources . . . 400
32.5.1 The optimization problem . . . 400
32.5.2 Channel ranking . . . 400
32.5.3 The credibility-reach tradeoff . . . 400
32.6 Transparency and Disclosure . . . 401
32.6.1 Funding transparency as counter-doxonomic tool . . . 401
32.6.2 Institutional transparency requirements . . . 401
32.7 Coalition and Scale . . . 401
32.7.1 The coordination problem . . . 401
32.8 Notes and References . . . 402
32.9 Exercises . . . 402

33 Epistemic Democracy **405**
33.1 The Problem . . . 405
33.1.1 Epistemic concentration and democratic failure . . . 405
33.1.2 Three failure modes . . . 406
33.2 Normative Foundations . . . 406
33.2.1 The deliberative ideal . . . 406
33.2.2 The agonistic alternative . . . 406
33.3 Institutional Designs . . . 407
33.3.1 Public-interest media . . . 407

33.3.2 Open curricula . . . 408
33.3.3 Institutional pluralism . . . 408
33.3.4 Transparency requirements . . . 409
33.4 Mechanism Design for Belief Production . . . 409
33.4.1 The design problem . . . 409
33.4.2 Deliberative mini-publics . . . 409
33.4.3 Epistemic public goods . . . 410
33.5 The Diversity-Coordination Tradeoff . . . 410
33.5.1 The optimal entropy problem . . . 410
33.6 Limitations and Risks . . . 411
33.6.1 Who guards the guardians? . . . 411
33.6.2 The risk of epistemic paternalism . . . 411
33.7 Notes and References . . . 411
33.8 Exercises . . . 412

34 Designing Better Belief Ecologies 415
34.1 Design Principles . . . 415
34.1.1 Tensions between principles . . . 416
34.2 Cooperative Anthropologies . . . 416
34.2.1 The evidence base . . . 416
34.2.2 Existing models . . . 417
34.3 Information Commons Design . . . 417
34.3.1 Information as commons . . . 417
34.3.2 Design elements . . . 418
34.4 A Policy Toolkit . . . 419
34.4.1 Specific interventions . . . 419
34.4.2 The optimal belief ecology model . . . 419
34.4.3 Transition pathways . . . 419
34.5 Real-World Experiments . . . 420
34.6 Limits of Design . . . 420
34.6.1 The power problem . . . 420
34.6.2 The complexity problem . . . 421
34.6.3 The pluralism problem . . . 421
34.7 Notes and References . . . 421
34.8 Exercises . . . 421

35 Ethics of Doxonomics 425
35.1 Description vs. Intervention . . . 425
35.1.1 The observer effect . . . 425
35.1.2 The transparency principle . . . 426
35.2 The Danger of Technocratic Belief Management . . . 426
35.2.1 The temptation . . . 426
35.2.2 Historical warnings . . . 426
35.2.3 The line . . . 427

35.3 The Dual-Use Problem 427
35.3.1 Knowledge as weapon 427
35.3.2 The authoritarian adoption scenario 428
35.3.3 Can the dual-use problem be solved? 428
35.4 Research Ethics 428
35.4.1 Specific ethical challenges 428
35.4.2 A proposed ethics code 429
35.5 The Responsibility of Knowledge 429
35.5.1 What follows from knowing? 429
35.6 The Doxonomic Paradox 430
35.7 Notes and References 431
35.8 Exercises 431

36 Toward a Science of Social Self-Understanding **433**
36.1 What Doxonomics Can Explain 433
36.2 What Doxonomics Cannot Explain 434
36.3 Open Problems 435
36.4 Future Research Programs 436
36.4.1 Computational doxonomics 436
36.4.2 Comparative doxonomics 436
36.4.3 Historical doxonomics 437
36.4.4 Applied doxonomics 437
36.5 Doxonomics and Its Neighbors 437
36.6 What Would Success Look Like? 438
36.7 Final Reflection 439
36.8 Notes and References 439
36.9 Exercises 440

Glossary of Doxonomic Terms **443**

Mathematical Notation and Basic Models **447**

Guide to Data Sources **449**

Sample Doxometric Survey Instruments **453**

Network and Accounting Templates **457**

Suggested Datasets, Archives, and Corpora **459**

Replication Exercises **461**

Recommended Reading **463**

References **467**

Index **477**

Preface

Every society produces goods, laws, and infrastructures. Every society also produces beliefs about what people are, what they deserve, what is possible, and what is natural. The first kind of production is studied by economics, engineering, and political science. The second kind has no dedicated science.

This book proposes one.

Doxonomics is the science of how material power shapes public belief. The term combines the Greek *doxa* (opinion, common belief, public orthodoxy) with *-nomics* (the systematic study of allocation and structure). Its central question is not whether a belief is true, but what it cost to make it appear self-evident: who financed it, which institutions processed it, through what channels it circulated, and what social effects followed from its dominance.

The need for such a field is not difficult to motivate. Global advertising exceeded one trillion dollars in 2024. Lobbying, think-tank funding, public relations, and curriculum sponsorship add hundreds of billions more. Existing disciplines study parts of this process: sociology of knowledge examines the social formation of ideas, political communication traces agenda-setting, media studies analyzes representation, propaganda studies maps persuasion techniques, and social epistemology investigates the conditions of collective knowledge. What no existing field does is integrate these strands around *explicit accounting of material support, institutional routing, and measurable belief effects*. Political economy studies the distribution of material power but not its conversion into common sense. Sociology of knowledge studies the social formation of ideas but rarely performs financial accounting on them. Media studies analyzes representation but seldom asks which representations are continuously subsidized and to what measurable effect. Doxonomics sits at the intersection of all these fields and adds what they individually lack: a unified framework for auditing the industrial production of belief.

This textbook is mathematically serious. We take the position that critique without formal tools remains vulnerable to the same vagueness it diagnoses. The field needs stock-and-flow models, causal inference, network analysis, information-theoretic measures, and sheaf-theoretic coherence conditions where the structure demands them. Many of the models presented here are heuristic or conjectural rather than empirically calibrated; we mark them as such. Their purpose is to clarify structure and generate testable predictions, not to simulate

maturity the field has not yet earned. A note on the formal environments used throughout the book: *Theorems* are results that follow rigorously from stated assumptions (they may be conditional on stylized premises, but the derivation is exact). *Propositions* are model-derived claims: they follow from a formal model's assumptions but depend on those assumptions being a reasonable approximation of reality, which is often an open empirical question. *Models* are explicit simplifications of complex systems, useful for generating predictions and structuring analysis but not to be confused with descriptions of reality. *Conjectures* are claims we believe to be true but cannot yet prove or have not yet tested. *Definitions* fix terminology; they are stipulative, not empirical. *Remarks* are observations, interpretive claims, or conceptual points that do not have the formal status of derived results. Where illustrative numerical examples appear, they are order-of-magnitude estimates or hypothetical scenarios designed to show the structure of an argument, not empirically calibrated measurements, unless a specific source is cited. The reader should calibrate their confidence accordingly: the architecture is more mature than the measurement, and the measurement is more mature than the prediction.

Throughout the text, we reference interactive *playgrounds*: computational environments where the reader can manipulate funding parameters, observe belief diffusion, simulate narrative cascades, and test the sensitivity of doxonomic models to their assumptions. These are available at the Piatra Institute's companion site.

The book proceeds in five parts. Part I lays the conceptual and historical foundations. Part II develops the core formal apparatus: epistemic capital, narrative infrastructure, common-sense capture, doxonomic power, and sheaf-like coherence. Part III introduces the methods: measurement, accounting, network analysis, causal inference, computational text analysis, and experimental design. Part IV applies the machinery to nine domains, from the managed narrative of selfish human nature to crisis doxonomics. Part V turns to resistance, repair, and the ethics of studying belief production without becoming belief engineers.

No single author could write this book. It emerges from a research program at the Piatra Institute, and it will remain open to revision as the field develops. The reader is invited to learn doxonomics and to extend it.

Piatra Institute, 2026

Notation

The following symbols and conventions are used throughout the text. Page numbers indicate the first substantive appearance of each symbol.

Belief Variables

Symbol	Name	Description
B_i	Belief strength	Social strength of belief i in the population
$B_i(t)$	Belief at time t	Time-indexed belief strength
$\boldsymbol{B}$	Belief vector	Vector of all belief strengths $(B_1, \ldots, B_n)$
$\mathcal{B}$	Belief space	The space of all possible belief configurations
X_i	Countervailing force	Aggregate pressure opposing belief i

Funding and Channels

Symbol	Name	Description
F_k	Funding flow	Resources flowing through channel k
$\boldsymbol{F}$	Funding vector	Vector of all funding flows $(F_1, \ldots, F_m)$
C_k	Credibility	Credibility weight of channel k
P_k	Population reach	Fraction of population exposed via channel k
T_k	Temporal persistence	Duration and repetition factor of channel k
$R_{k,i}$	Relevance	Relevance of channel k to belief i

Structural Objects

Symbol	Name	Description
$\mathfrak{D}$	Doxonomic system	A structured ensemble of actors, resources, institutions, and channels producing belief
$\mathcal{B}$	Belief production chain	The full sequence from funding to behavioral consequence
$\mathcal{N}$	Narrative infrastructure	The durable channels through which a society reproduces its common sense
$\mathcal{I}$	Institutional ecology	The ensemble of institutions stabilizing a belief regime
$\mathcal{E}$	Epistemic capital	Resources convertible to credibility, attention, or authority
$\mathbf{D}$	Doxa operator	The operator mapping resource allocations to belief distributions

Spaces and Categories

Symbol	Name	Description
$\mathcal{N}$	Narrative space	The space of available narratives
$\mathcal{A}$	Agent space	The space of doxonomic agents
Inst	Category of institutions	Category whose objects are institutions and whose morphisms are influence relations
$\mathscr{F}$	Sheaf of local beliefs	Sheaf assigning local belief systems to institutional contexts
$\mathbb{R}$	Real numbers	
$\mathbb{N}$	Natural numbers	

Operators and Indices

Symbol	Name	Description
EHI	Epistemic Herfindahl Index	Concentration score for belief-production market share
IROI	Ideological ROI	Return on ideological investment: belief change per unit funding
$\mathbb{E}[\cdot]$	Expectation	Expected value operator
$\mathbb{P}(\cdot)$	Probability	Probability measure

Conventions

- Subscript i indexes beliefs; subscript k indexes channels or institutions.
- Time dependence is written $f(t)$; discrete time steps use f_t.
- Bold lowercase ($\boldsymbol{x}$) denotes vectors; bold uppercase ($\boldsymbol{A}$) denotes matrices.
- Calligraphic letters ($\mathcal{B}, \mathcal{N}$) denote spaces or structured sets.
- Fraktur ($\mathfrak{D}$) denotes systems or large composite structures.
- Script ($\mathscr{F}$) denotes sheaves.
- Sans-serif (Cat) denotes categories when disambiguation is needed.

Part I

Foundations

CHAPTER 1

What Is Doxonomics?

> The most potent weapon in the hands of the oppressor is the mind of the oppressed.
>
> Steve Biko

Human beings do not merely inhabit economies and legal systems. They inhabit interpretive worlds: shared assumptions about what people are, what is possible, what is deserved, and what cannot be changed. These assumptions are rarely spontaneous. They are funded, repeated, institutionalized, and defended.

Doxonomics is the study of how material power shapes public belief. The term derives from the Greek *doxa* (opinion, common belief, public orthodoxy) and denotes the systematic investigation of how beliefs become socially normal. Its central question is not whether a belief is true, but:

What did it cost to make this belief appear self-evident?

This question is not rhetorical. It is a research question with empirical content. Global advertising expenditure surpassed one trillion dollars in 2024. U.S. lobbying and political spending exceed tens of billions annually. Philanthropic grants to policy-oriented think tanks run into hundreds of millions per year, channeled through networks of foundations whose 990 filings are public record. University curricula shape the foundational assumptions of millions of students per decade. Platform algorithms determine which narratives reach which audiences at what frequency. Each of these is a measurable flow of resources into the production of belief, and none of them is systematically tracked by any existing discipline as a *unified* phenomenon.

Doxonomics proposes to track them.

1.1 The Object of Study

Modern societies devote enormous resources to the production of goods, laws, and infrastructures. They also devote immense resources to the production of legitimacy, resignation, aspiration, and moral common sense. A society does not only distribute wealth; it distributes interpretations of the world. Some interpretations are amplified until they appear obvious. Others are starved of attention until they appear unrealistic or unintelligible.

Doxonomics studies this process. It asks how money becomes belief, how institutions become credibility, how repetition becomes reality, and how narratives become embedded in everyday life (Bourdieu 1991; Herman and Chomsky 1988).

Consider a concrete example. The proposition "human nature is selfish" is not merely a philosophical claim. It is an anthropological assumption embedded in economics curricula (taught to over ten million students per decade in the United States alone), management theory (principal-agent models presuppose worker self-interest), policy design (incentive-based regulation assumes that agents will not cooperate without material reward), advertising (which addresses the consumer as an isolated desire-maximizer), and popular culture (which narrates life as competition). Each of these institutional sites has a budget. Each produces narrative output. Each reaches an audience. The combined effect is an interpretive environment in which "selfishness is natural" operates as background reality rather than as a contestable claim.

Is this belief *true*? That is an empirical question, and the experimental evidence is considerably more mixed than the institutional consensus suggests (Chapter 21). The doxonomic question is different: *what institutional apparatus sustains this belief, at what cost, through which channels, and with what social effects?*

Definition 1.1 (Doxonomic System)**.** A *doxonomic system* is a tuple

$$\mathfrak{D} = (\mathcal{A}, \mathcal{I}, \mathcal{N}, \mathcal{B}, \Phi, \Psi)$$

where:

- $\mathcal{A}$ is a set of agents (funders, intermediaries, audiences),
- $\mathcal{I}$ is an institutional ecology (the ensemble of belief-processing institutions),
- $\mathcal{N}$ is a narrative space (the set of available narratives and framings),
- $\mathcal{B}$ is a belief space (the space of possible population-level belief configurations),
- $\Phi : \mathbb{R}^m_{\geq 0} \times \mathcal{I} \to \mathcal{N}$ is the *production function* mapping funding and institutions to narrative outputs,
- $\Psi : \mathcal{N} \times \mathcal{B} \to \mathcal{B}$ is the *internalization function* mapping narrative exposure and prior beliefs to updated beliefs.

Remark 1.2. This definition is deliberately abstract. It does not specify the internal structure of agents, the topology of the institutional ecology, or the dimensionality of the belief space. These are specified in later chapters as needed. The purpose of the tuple is to establish that doxonomics has a *formal object*: a mathematical structure that can be analyzed, compared, and measured.

The aim is not conspiracy thinking. A doxonomic system need not have a single controller. Coordination may be deliberate, distributed, emergent, or structural. A belief can dominate because many institutions, each acting locally and rationally, produce the same directional effect. Herman and Chomsky (1988) demonstrated this for media: five structural filters (ownership, advertising dependence, sourcing, flak, and ideological convergence) produce systematic bias without requiring any explicit coordination. Doxonomics generalizes this insight beyond media to the full institutional landscape of belief production.

In this respect, doxonomics is closer to epidemiology than to melodrama. Epidemiology does not require a single villain who spreads disease. It maps transmission pathways, identifies risk factors, measures incidence, and designs interventions. Doxonomics does the same for belief.

1.2 The Core Conversion Problem

The foundational problem of doxonomics is the **conversion problem**:

> *How are resources converted into durable public belief?*

This conversion is never one-to-one. One million dollars spent on direct advertising is not equivalent to one million dollars spent on textbooks, academic chairs, or platform placement. Different channels have different reach, credibility, persistence, and downstream effects. A think-tank report that shapes a government white paper that shapes a curriculum guideline that shapes twenty years of classroom instruction has a different doxonomic trajectory than a viral social media post that is forgotten in a week.

Model 1.3 (First-Order Belief Equation)**.** As a first approximation, the social strength of belief i at time t is

$$B_i(t) = \sum_{k=1}^{m} F_k(t) \cdot C_k \cdot R_{k,i} \cdot P_k \cdot T_k - X_i(t) \tag{1.1}$$

where $F_k(t)$ is funding through channel k, C_k is the credibility weight of that channel, $R_{k,i}$ is the relevance of channel k to belief i, P_k is the population fraction reached, T_k is the temporal persistence factor, and $X_i(t)$ is the aggregate countervailing pressure against belief i.

This equation is a conceptual scaffold, not a mature model. It is linear, static, and treats parameters as exogenous constants when in reality they are endogenous, time-varying, and interdependent. Its purpose is to formalize a basic claim: beliefs are not just argued; they are *financed exposures mediated by institutions*. Later chapters will replace this linear approximation with dynamical models (Chapter 11), threshold effects (Chapter 8), and network diffusion (Chapter 15).

Even in its crude form, the equation reveals something important. Consider two beliefs:

- p_1: "human nature is selfish," promoted through economics curricula ($C \approx 0.9$, $T \approx 30$ years), management training, advertising, and entertainment.
- p_2: "humans are conditional cooperators," supported by experimental evidence but with minimal institutional infrastructure ($F \approx 0$, $T \approx 0$).

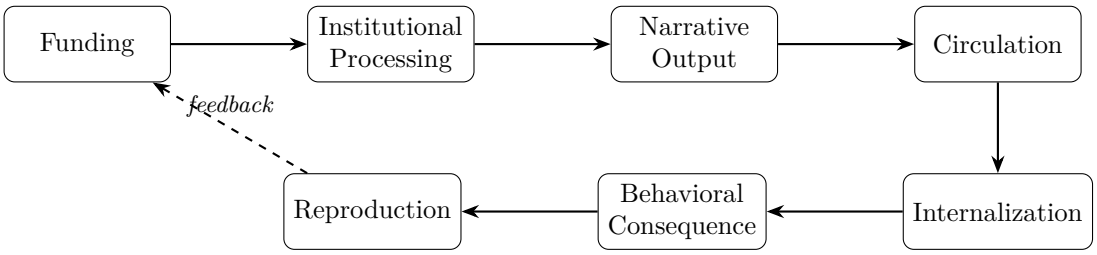
The first-order model predicts $B_1 \gg B_2$ regardless of the evidential merits of p_1 versus p_2. This is the asymmetry that doxonomics studies.

Remark 1.4. The equation should not be read as claiming that *only* money matters. Evidence, lived experience, peer discussion, and individual reasoning all contribute to belief formation. But the equation identifies a structural advantage: beliefs with institutional support have a baseline "subsidy" that beliefs without institutional support lack. The playing field of ideas is not level; doxonomics measures the tilt.

1.3 The Belief Production Chain

The full process from expenditure to social consequence is the **belief production chain**. It consists of seven stages, each with its own logic, costs, and failure modes:

1. **Funding**: resources are allocated to belief-production channels.
2. **Institutional processing**: institutions (universities, think tanks, media, PR firms) transform funding into credentialed narrative.
3. **Narrative output**: the processed material takes the form of research papers, op-eds, textbooks, films, curricula, advertisements, policy briefs.
4. **Circulation**: narratives reach audiences through media, education, social networks, and platform algorithms.
5. **Internalization**: audiences update their beliefs, norms, and practical dispositions in response to narrative exposure.
6. **Behavioral consequence**: internalized beliefs alter behavior: cooperation, voting, consumption, labor compliance, tolerance of inequality.
7. **Reproduction**: behavioral changes generate new institutional demands, electoral outcomes, and philanthropic priorities that feed back into the funding stage.



The dashed feedback arrow is critical. The chain closes when the beliefs produced by the system generate exactly the behaviors and institutions that sustain those beliefs. At that point the system has reached a *doxonomic equilibrium*. At equilibrium, the belief appears to reproduce itself spontaneously, without visible effort. This is the condition that Bourdieu called *doxa*: a belief so deeply embedded that it is no longer experienced as a belief at all (Bourdieu 1977, pp. 164–170).

Chapter 5 formalizes each stage as a mathematical operator and the full chain as their composition.

Example 1.5 (The Neoliberal Belief Production Chain). The belief "markets are the most efficient allocators of resources" can be traced through a concrete chain:

1. **Funding**: Koch, Scaife, Olin, and Bradley foundations directed hundreds of millions of dollars into free-market intellectual infrastructure from the 1970s onward (Mayer 2016).
2. **Institutional processing**: Heritage Foundation, Cato Institute, American Enterprise Institute, and Mont Pèlerin Society produced research, policy briefs, and expert testimony (Mirowski and Plehwe 2009).
3. **Narrative output**: op-eds, books (*Free to Choose*, *The Road to Serfdom*), textbooks (Mankiw's *Principles of Economics*), and television programs.
4. **Circulation**: editorial pages of *Wall Street Journal*, *Financial Times*; economics curricula at thousands of universities; cable news; social media.
5. **Internalization**: generations of students, policymakers, journalists, and voters absorbed market-efficiency assumptions as common sense.
6. **Behavioral consequence**: deregulation, privatization, austerity, reduced union membership, increased tolerance for inequality.
7. **Reproduction**: beneficiaries of deregulation and low taxation reinvested in the same think tanks and foundations, closing the loop.

This is not a conspiracy theory. It is a documented institutional history with named actors, traceable funding, and measurable outcomes. The doxonomic contribution is to treat it as a *system* with formal structure, not merely as a sequence of political events.

1.4 What Doxonomics Is Not

Several misreadings should be preempted.

Doxonomics is not a claim that all beliefs are manufactured. Many beliefs arise from direct experience, logical inference, or scientific investigation. Doxonomics studies the *differential amplification* of beliefs: the fact that some beliefs receive vastly more institutional support than others. It does not claim that evidence is irrelevant.

Doxonomics is not a claim that truth is reducible to power. A belief can be both true and heavily funded, or false and poorly funded, or any combination. The doxonomic audit reveals the material scaffolding of belief; the epistemic evaluation remains a separate task. Chapter 2 develops this distinction in detail.

Doxonomics is not a claim that people are passive. Audiences interpret, resist, reinterpret, ignore, and subvert the narratives they encounter. A doxonomic system that spends billions may still fail to achieve capture. Understanding why it fails is as important as understanding why it succeeds. The field studies production, not automatic absorption.

Doxonomics is not conspiracy theory. Conspiracy theories posit secret coordination by a small group. Doxonomic systems can operate through open, legal, well-documented institutional processes. The funding is often on public record (IRS 990 filings, lobbying disclosures, advertising expenditure reports). The coordination is often structural (shared incentives, overlapping networks, common training) rather than secret. The analogy is market competition: firms in the same industry produce similar products not because they conspire, but because they face similar incentives.

1.5 Scope and Limits

Principle 1.6 (Scope of Doxonomics)**.** Doxonomics studies the *differential amplification* of beliefs: the mechanisms by which some beliefs receive vastly more institutional support, repetition, and prestige than others, and the social consequences of this asymmetry.

The scope is deliberately limited. Doxonomics does not attempt to explain all belief formation. It does not replace psychology (which studies individual cognition), epistemology (which studies the conditions for justified belief), or political theory (which studies the legitimacy of institutional arrangements). It adds something that none of these fields provides: a systematic accounting of the material infrastructure of public belief.

A society that can estimate inflation, unemployment, and carbon intensity, but cannot estimate the industrial production of its own common sense, remains partially blind to itself. Doxonomics seeks to reduce that blindness.

1.6 Neighboring Fields and the Distinctive Contribution

Doxonomics draws on and extends several existing disciplines, but is identical to none of them.

Political Economy	Studies material power but not its conversion into common sense.
Sociology of Knowledge	Studies social formation of ideas but rarely performs financial accounting.
Media Studies	Analyzes representation but not which representations are subsidized.
Propaganda Studies	Maps persuasion techniques but often lacks formal models.
Social Epistemology	Studies collective knowledge but not its material infrastructure.
Behavioral Economics	Studies cognitive bias but not the institutional environment that exploits it.
Doxonomics	**Integrates all of the above around explicit accounting of material support, institutional routing, and measurable belief effects.**

The distinctive contribution is the insistence on *accounting*: tracing specific dollar amounts through specific institutions to specific narrative outputs with measurable effects on specific populations. This is what makes doxonomics a potential science rather than a critical commentary.

1.7 The Structure of This Book

The book proceeds in five parts.

Part I (Foundations) establishes the conceptual base: the ontology of belief, the intellectual prehistory, the core units of analysis, and the belief production chain.

Part II (Concepts and Models) develops the formal apparatus: epistemic capital, narrative infrastructure, common-sense capture, doxonomic

power, the economics of belief production, dynamical models, and sheaf-theoretic coherence.

Part III (Methods) introduces the empirical toolkit: doxometric measurement, belief-flow accounting, network analysis, causal inference, text analysis, historical methods, experimental design, and model validation.

Part IV (Applications) applies the machinery to specific domains: selfish-human-nature narratives, meritocracy, consumerism, inequality, race and coloniality, austerity, work discipline, national myth, technology, and crisis.

Part V (Resistance, Repair, and Reconstruction) turns to counter-strategies, epistemic democracy, belief ecology design, ethics, and open problems.

Throughout, interactive *playgrounds* allow the reader to manipulate funding parameters, simulate diffusion, and test model sensitivity. These are available at the Piatra Institute's companion site.

1.8 Notes and References

The concept of belief as a social product has deep roots. Marx and Engels (1846) argued that the ruling ideas of any epoch are the ideas of the ruling class. Gramsci (1971) developed this into a theory of hegemony: the production of consent through civil society rather than through coercion alone. Bourdieu (1984) introduced the concept of *doxa* as the unquestioned background of social life, extended in Bourdieu (1991) to the analysis of language and symbolic power. Berger and Luckmann (1966) provided the foundational account of reality as a social construction. Mannheim (1936) developed the sociology of knowledge as a systematic discipline. Althusser (1971) formalized the concept of ideological state apparatuses.

Turning to media specifically, Lippmann (1922) pioneered the analysis of how mass media manufacture public opinion. Herman and Chomsky (1988) provided the most systematic media-level account with the propaganda model. Ellul (1965) analyzed propaganda as a total social phenomenon, not merely a state tool. The conversion problem connects to Bernays (1928) on the engineering of consent. For the economic logic of belief subsidies, see Coase (1974) and Stigler (1961).

On the institutional history of specific belief production systems, Mirowski and Plehwe (2009) traces the Mont Pèlerin Society and the construction of neoliberal common sense. Mayer (2016) documents the dark-money networks behind American conservative ideology. Oreskes and Conway (2010) details the manufacture of doubt about climate science and tobacco harms. Slobodian (2018) provides a complementary genealogy of neoliberal internationalism.

1.9 Exercises

Exercise 1.1. Identify three widely held beliefs in your society that present themselves as descriptions of human nature or social reality (e.g., "competition drives excellence," "there is no alternative to the market"). For each, list two institutions that regularly repeat them and estimate (order of magnitude) the annual budget of those institutions.

Exercise 1.2. Using the first-order belief equation (1.1), argue qualitatively why a belief can persist even when the underlying evidence shifts against it, provided F_k and T_k remain high. Give a real-world example.

Exercise 1.3. Consider the belief "markets are self-correcting." Map it onto the belief production chain, identifying at least one concrete actor or institution at each stage. Where is the chain strongest? Where is it most vulnerable to disruption?

Exercise 1.4. Extend Definition 1.1 to include a *resistance function* $\Omega : \mathcal{B} \to \mathbb{R}^m_{\geq 0}$ that models how population beliefs generate counter-pressure on funding channels. Write down a fixed-point condition for equilibrium and discuss what it would mean for a society to be at such a fixed point.

Exercise 1.5. Choose a belief that has *lost* institutional support over the past century (e.g., the divine right of kings, explicit racial hierarchy as scientific consensus, the gold standard as natural law). Trace its decline through the belief production chain. At which stage did the chain break first?

Exercise 1.6. Identify a doxonomic system that operates primarily through non-monetary channels, such as family socialization, religious ritual, or architectural design. How would you modify Definition 1.1 to accommodate non-monetary resource flows? What does this reveal about the limits of a funding-centered framework?

Exercise 1.7. The text compares doxonomics to epidemiology. Push the analogy further: what would the doxonomic equivalents of "pathogen," "transmission vector," "incubation period," "herd immunity," and "vaccination" be? Where does the analogy break down?

CHAPTER 2

The Ontology of Public Belief

> What is most difficult to perceive is what is taken for granted.
>
> Pierre Bourdieu

Before we can study how beliefs are produced, we must clarify what a belief *is*, and what distinguishes a *public* belief from a private mental state. Doxonomics is not psychology. Its object is not the individual mind but the social distribution of interpretive commitments: what a population takes to be true, normal, natural, or inevitable, and how that distribution is shaped by institutional forces.

This chapter provides the ontological ground floor. It distinguishes opinion from belief from ideology from common sense from doxa, formalizes each, addresses the gap between private thought and public expression, introduces anthropological regimes, develops a layered ontology that goes beyond propositions, and confronts the relationship between truth and power that any such project must face.

2.1 Opinion, Belief, Ideology, Common Sense, Doxa

Ordinary language conflates several distinct objects. A newspaper editorial is an "opinion"; a religious conviction is a "belief"; a political program is an "ideology"; the assumption that growth is good is "common sense"; and the taken-for-granted nature of wage labor is something so deep it barely has a name. Doxonomics needs sharp distinctions among these because each has a different production cost, institutional profile, and vulnerability to disruption.

Definition 2.1 (Belief)**.** A *belief* is a proposition p together with a subjective probability $\pi(p) \in [0, 1]$ that an agent assigns to its truth. A *public belief*

is a measurable aggregate: a distribution μ over the population such that $\mu(p) = \mathbb{E}_{j \in \text{Pop}}[\pi_j(p)]$ gives the population-average credence in p.

Remark 2.2. This definition is precise but deliberately narrow. It models belief as propositional and probabilistic, suitable for claims like "most people are selfish" or "markets are efficient," which can be assigned truth values. Much of what doxonomics studies, however, does not fit neatly into this format. We address this limitation in Section 2.4 below. The propositional model is a workable first approximation, not a claim about the deep structure of cognition.

An *opinion* is a belief that the holder recognizes as contestable, one among several possible views. The distinguishing feature is reflexive awareness: the opinion-holder knows that others disagree and does not experience the disagreement as irrational. Opinions are relatively cheap to produce and easy to change.

Definition 2.3 (Ideology)**.** An *ideology* is a structured set of propositions $\mathcal{P} = \{p_1, \ldots, p_n\}$ equipped with an internal logic (deductive, narrative, or affective) such that acceptance of a subset tends to raise credence in the others. Formally, for $S \subset \mathcal{P}$ and $p_j \notin S$:

$$\mathbb{E}[\pi(p_j) \mid \pi(p_i) > \tau \text{ for all } p_i \in S] > \mathbb{E}[\pi(p_j)]$$

The *coherence strength* of the ideology is

$$\kappa(\mathcal{P}) = \frac{1}{|\mathcal{P}|^2} \sum_{i \neq j} \text{Corr}(\pi(p_i), \pi(p_j))$$

measuring how tightly the propositions are bundled in the population's belief structure.

Example 2.4. The neoliberal ideology bundles: p_1 = "markets are efficient," p_2 = "government intervention distorts," p_3 = "individuals are responsible for their outcomes," p_4 = "deregulation promotes growth," p_5 = "inequality reflects differential contribution." Accepting p_1 raises credence in p_2–p_5 not by logical entailment but by narrative coherence: they "fit together" as a worldview. A person exposed to p_1 through economics education is more likely to accept p_3 through meritocratic framing, even though the two claims are logically independent. The doxonomic significance of ideology is that bundling reduces the per-proposition production cost: investing in one node of the bundle raises credence across the whole set.

Definition 2.5 (Common Sense)**.** A proposition p is *common sense* in a population if:

1. $\mu(p) > \theta$ for a high threshold θ (widespread adoption),

2. $\mathrm{Var}(\pi_j(p))$ is low (tight concentration: near-universal belief, not merely high average),
3. p is rarely challenged in mainstream institutional discourse.

Common sense is not merely widespread belief; it is belief whose distribution is tightly concentrated around high credence and whose contestation is socially costly.

Bourdieu (1984) introduced *doxa* as the deepest layer: propositions so thoroughly embedded that they are not perceived as beliefs at all. They are experienced as the texture of reality rather than as assertions. A person operating within doxa does not *agree* that wage labor is natural; they simply cannot imagine economic life organized otherwise.

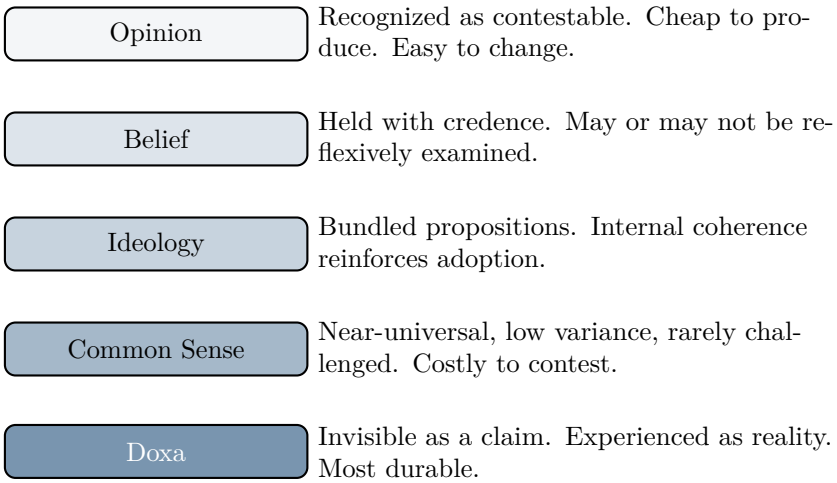
Definition 2.6 (Doxa)**.** A proposition p is *doxic* in a population if it satisfies the conditions for common sense and, additionally:

4. p is not represented in public discourse as a contestable claim. It is invisible as a proposition.

The transition from common sense to doxa is the transition from "everyone agrees" to "there is nothing to agree or disagree about." This is the deepest form of doxonomic achievement: the belief has been absorbed into the infrastructure of perception.

Remark 2.7. The invisibility condition (4) is the hardest to operationalize. One proxy: the frequency with which p appears as the *conclusion* of an argument versus the frequency with which it appears as an unstated *premise*. A doxic proposition is almost never argued for; it is argued *from*. Corpus analysis (Chapter 17) can detect this asymmetry.

The doxonomic production cost increases as we move from opinion to doxa. Changing an opinion requires a persuasive argument. Changing common sense requires sustained institutional effort. Changing doxa requires making the invisible visible, which is the most difficult and most important task of doxonomic analysis.



2.2 Private Belief and Public Expression

The distinction between what people privately think and what they publicly act on is not merely philosophical. It has precise game-theoretic structure, and it is doxonomically consequential, because a doxonomic system need not convince people in order to govern them. It suffices to maintain the *appearance* of consensus.

Definition 2.8 (Pluralistic Ignorance)**.** A population exhibits *pluralistic ignorance* with respect to p if:

1. $\mu_{\text{private}}(p) < \tau$: most individuals privately doubt p,
2. $\mu_{\text{expressed}}(p) > \tau$: most individuals publicly affirm p,
3. this gap is sustained by the false belief that most others sincerely hold p.

Example 2.9. In many corporate environments, employees privately doubt that constant growth is sustainable or that competition among colleagues improves performance. But each employee, observing that everyone else appears to endorse these claims (in meetings, in performance reviews, in public communication), concludes that their own doubt is unusual. The result: a collective performance of belief that no individual sincerely holds. The doxonomic system need only maintain the performance, not the conviction.

Kuran (1995) formalized this as *preference falsification*: individuals misrepresent their private beliefs to conform to perceived public norms, and the aggregate misrepresentation creates the very norms it appears to obey. The cost of maintaining false consensus is typically lower than the cost of genuine persuasion, which is one reason pluralistic ignorance is a recurrent feature of doxonomic regimes.

Model 2.10 (Preference Falsification Game)**.** Let n agents each have a private belief $\pi_j \in [0,1]$ and choose a public expression $e_j \in \{0,1\}$ (affirm or dissent). Each agent faces:

- a *conformity payoff* $c \cdot |\bar{e} - e_j|$ penalizing deviation from the average expression,
- a *sincerity cost* $s \cdot |e_j - \mathbf{1}[\pi_j > 0.5]|$ from expressing what one does not believe,
- a *reputation payoff* $r(e_j)$ from institutional rewards for affirming p.

When $c + r > s$, agents affirm p regardless of private belief. The equilibrium expression $\bar{e}^* = 1$ is then supported even if $\mu_{\text{private}}(p) < 0.5$.

Proposition 2.11 (Fragility of Pluralistic Ignorance)**.** *A pluralistic-ignorance equilibrium is fragile: if a sufficient number of agents simultaneously reveal their private beliefs, the equilibrium collapses. Formally, if $k > k^*$ agents express dissent, the conformity payoff reverses sign and a cascade of honest expression follows. The threshold k^* depends on the distribution of private beliefs and the conformity parameter c. This is the mechanism underlying the sudden collapse of apparently stable regimes, what Kuran (1995) calls "the element of surprise in revolutions."*

This has a direct doxonomic implication: some apparently dominant belief regimes are held together by expression management, not by genuine conviction. Doxonomic systems that rely on pluralistic ignorance rather than deep internalization are cheaper to maintain but more vulnerable to sudden collapse. Chapter 31 develops this further.

2.3 Anthropological Regimes

The most consequential beliefs are not about policy but about *what human beings are*. Policy disputes presuppose an anthropology: if humans are selfish, then institutions must use incentives; if they are cooperative, then institutions can rely on reciprocity; if they are plastic, then the institutional environment itself determines the outcome.

Definition 2.12 (Anthropological Regime)**.** An *anthropological regime* is a dominant practical model α of human nature, specifying:

1. a *motivational theory* (what drives people: self-interest, status, care, duty, fear, ...),
2. a *social ontology* (whether persons are fundamentally isolated or constitutively relational),
3. a *capacity claim* (what people can and cannot do collectively: cooperate without coercion? govern themselves? share resources sustainably?).

Formally, $\alpha \in \mathcal{A}$ where $\mathcal{A}$ is the space of such models, and the population's effective anthropological regime is

$$\hat{\alpha} = \arg\max_{\alpha \in \mathcal{A}} \sum_j w_j \cdot \mathbf{1}[\alpha_j = \alpha]$$

where w_j are institutional weights reflecting not headcount but institutional embeddedness.

The institutional weighting w_j is essential. An anthropological regime can dominate even if most individuals privately doubt it, provided it is embedded in the institutions that structure daily life: workplaces, schools, legal systems, media. A worker who privately believes in cooperation but operates within a workplace designed around the assumption of shirking lives under a selfish-anthropology regime regardless of private conviction.

Example 2.13 (Competing Anthropological Regimes). Three historically significant regimes:

Hobbesian (α_H): humans are competitive by nature; order requires sovereignty, enforcement, and hierarchy. Institutional expression: criminal justice systems, competitive labor markets, principal-agent contracts.

Smithian-Neoclassical (α_S): humans are rational self-interest maximizers; social welfare emerges from individual optimization within markets. Institutional expression: economics curricula, cost-benefit analysis, incentive-based regulation.

Cooperative (α_C): humans are conditional cooperators; collective action is possible under appropriate institutional conditions. Institutional expression: commons governance, cooperatives, public goods provision, Scandinavian welfare states.

The doxonomic question is not which is "true" (all capture real tendencies) but which receives the most institutional support, and how that support shapes the evidence environment.

Anthropological regimes have a distinctive doxonomic property: they can be *self-fulfilling*. If institutions are designed around the assumption that people are selfish, they create environments that reward selfish behavior, which generates behavioral evidence for the selfish assumption, which justifies maintaining the institutions. Chapter 21 analyzes this feedback loop in detail.

2.4 Beyond Propositions: A Layered Ontology

The propositional-credence framework of the previous sections is a useful formal tool, but it does not exhaust the phenomena doxonomics must study. Many politically consequential "beliefs" are not well-modeled as explicit credences in propositions.

- **Practical schemas** (Bourdieu's *habitus*): embodied dispositions that organize perception and action without passing through conscious propositional evaluation. A person raised in a competitive school system does not decide that "life is competition"; they *perceive* the world through competitive categories, feel anxiety when not competing, and organize action around comparative performance, all without propositional mediation.
- **Social norms**: shared expectations about behavior that agents follow without necessarily believing them to be true or good. A norm can govern behavior even when no one endorses it (Cialdini 2006).
- **Identity commitments**: affiliations (national, religious, professional, racial, gendered) that structure interpretation prior to evidence evaluation. Identity acts as a *prior filter*: evidence consistent with identity is more readily absorbed; evidence threatening to identity is resisted or reinterpreted (Kahan et al. 2012).
- **Affective orientations**: trust, fear, disgust, and solidarity toward social categories, felt rather than believed. Racial prejudice, for example, often operates through affective response rather than propositional endorsement: a person may sincerely disavow racist beliefs while exhibiting implicit bias in behavior.
- **Tacit classifications**: the taken-for-granted categories through which experience is organized, such as "worker," "citizen," "consumer," "taxpayer," "illegal." These classifications are not beliefs *about* the world; they are the *grid* through which the world is apprehended. Changing a classification system is among the most difficult and consequential doxonomic interventions.

A person can *enact* an anthropological regime they cannot state propositionally. A worker who "knows" that competition is natural may not hold an explicit belief to that effect; the assumption is built into their behavioral repertoire, their emotional responses, and their sense of what is and is not possible.

Principle 2.14 (Layered Ontology)**.** Doxonomic analysis distinguishes at least five layers of socially shaped cognition:

1. **Propositional belief**: explicit credence in a statement ($\pi_j(p)$).
2. **Norm perception**: belief about what others believe or do ($\hat{\mu}_j$).
3. **Practical schema**: embodied disposition shaping action without deliberation.
4. **Identity commitment**: group affiliation structuring interpretation.
5. **Affective orientation**: emotional stance toward categories and institutions.

The probability representation used in most formal models of this book operates at layer 1. This is a *local convenience*, not a full ontology of ideological life. Layers 2–5 are acknowledged as important and addressed qualitatively where needed; their full formalization is an open problem for the field.

Remark 2.15. The layers differ in their doxonomic production pathways. Layer 1 (propositional belief) is most responsive to evidence and argument, and therefore to traditional persuasion. Layer 3 (practical schema) is produced primarily through prolonged institutional immersion (schooling, workplace discipline, military training) and is resistant to propositional counter-argument. Layer 5 (affective orientation) is shaped by repetition, association, and social identity, often below the threshold of conscious processing. A doxonomic system that operates at multiple layers simultaneously is more durable than one operating at layer 1 alone, because it cannot be dislodged by argument.

2.5 Truth, Power, and the Scope of Doxonomic Analysis

Doxonomics studies how beliefs are produced, not whether they are true. But this scope statement requires care, because the relationship between truth and power is not simple. A naively stated doxonomics could slide into the claim that "all socially successful beliefs are just power effects," which is both philosophically untenable and empirically false.

A belief may be:

1. funded *because* it is true (scientific consensus attracts institutional support: the germ theory of disease, the efficacy of vaccines),
2. made to *appear* true by subsidy (repetition creates familiarity, which is mistaken for evidence: "tax cuts pay for themselves"),
3. partly true but selectively amplified ("markets create wealth" is true in some senses, but the selective emphasis obscures distributional effects, externalities, and power asymmetries),
4. normatively useful but descriptively false ("hard work always pays off" motivates effort but misdescribes the economy),
5. descriptively accurate only under institutions built around it ("people are selfish" becomes true when institutions reward selfishness and punish cooperation: the self-fulfilling case).

Each type requires a different doxonomic analysis. Type 1 is not a doxonomic pathology at all; it is the normal operation of evidence-responsive institutions. Type 2 is pure doxonomic distortion. Types 3–5 are mixed cases that require careful disentangling.

Principle 2.16 (Separation of Audit and Evaluation)**.** The doxonomic audit (tracing material scaffolding) and the epistemic evaluation (assessing truth status) are *distinct operations*. A heavily funded belief is not automatically suspect; a poorly funded belief is not automatically true. The audit reveals the scaffolding. The evaluation requires independent evidence and argument. Conflating the two is a category error that doxonomics must avoid (Mannheim 1936; Fricker 2007).

Remark 2.17. This principle protects the field in both directions. It prevents critics from dismissing doxonomics as "everything you disagree with is ideology." And it prevents practitioners from assuming that revealing a belief's material support settles the question of its truth. The most interesting doxonomic cases are precisely those where the truth status is mixed or uncertain, and where the material scaffolding is doing real epistemic work, for better or worse.

2.6 Belief as Probability Distribution

With the layered ontology acknowledged, we proceed to the formal representation used in most of this book. For mathematical purposes, we represent a population's propositional beliefs as a probability measure μ on a proposition space $(\Omega, \mathcal{F})$, where Ω is the set of possible world-models and $\mathcal{F}$ is a σ-algebra of propositions.

Remark 2.18. Population-level belief is better represented as a *distribution* over individual credences than as a single mean. A society with 50/50 polarization and a society with universal moderate uncertainty can have the same mean credence $\mu(p) = 0.5$, but these are radically different doxonomic situations. Throughout this book, when we write B_i, we refer to a summary statistic. Full doxonomic analysis should attend to:

- the *shape* of the credence distribution (unimodal, bimodal, skewed),
- its *variance* and kurtosis,
- its *clustering by subgroup* (class, race, education, media environment),
- the *gap between private and expressed beliefs* (pluralistic ignorance),
- the *elite-mass divergence* (do elites and populations hold the same beliefs?).

Definition 2.19 (Belief Distribution)**.** The *belief distribution* for proposition p in a population of N agents is the empirical measure

$$\hat{F}_p(x) = \frac{1}{N} \sum_{j=1}^{N} \mathbf{1}[\pi_j(p) \leq x]$$

We define the following summary statistics:

- Mean belief: $\bar{\mu}(p) = \frac{1}{N} \sum_j \pi_j(p)$
- Belief variance: $\sigma^2(p) = \frac{1}{N} \sum_j (\pi_j(p) - \bar{\mu}(p))^2$
- Polarization index: $\text{Pol}(p) = 4\bar{\mu}(p)(1 - \bar{\mu}(p)) \cdot (1 + \sigma^2(p)/\bar{\mu}(p)(1 - \bar{\mu}(p)))$ when $\bar{\mu}(p) \in (0, 1)$

A belief is *polarized* when $\hat{F}_p$ is bimodal (clustered near 0 and 1) and $\text{Pol}(p)$ is high.

Proposition 2.20 (Belief Updating Under Unequal Exposure)**.** *Let agents update beliefs via Bayes' rule. If agent j observes evidence e_j drawn from a distribution ν_j that depends on the channels j is exposed to, then even*

rational agents will converge to different posteriors when their evidence streams differ systematically. Formally, if $\nu_j \neq \nu_k$ for agents j, k in different media environments, then generically $\pi_j(p \mid e_j) \neq \pi_k(p \mid e_k)$ even in the limit.

Proof sketch. Under Bayes' rule, the posterior after T signals is

$$\pi_j^{(T)}(p) = \frac{\pi_j^{(0)}(p) \prod_{t=1}^{T} L(s_t^{(j)} \mid p)}{\pi_j^{(0)}(p) \prod_{t=1}^{T} L(s_t^{(j)} \mid p) + (1 - \pi_j^{(0)}(p)) \prod_{t=1}^{T} L(s_t^{(j)} \mid \neg p)}$$

When the signal distribution ν_j systematically favors p (more signals consistent with p than with $\neg p$), the likelihood ratio $\prod_t L(s_t \mid p)/L(s_t \mid \neg p) \to \infty$, driving $\pi_j^{(T)} \to 1$. Two agents with the same prior but different signal distributions will diverge. The divergence rate is bounded below by the KL divergence $D_{\mathrm{KL}}(\nu_j \| \nu_k)$. □

This is the Bayesian foundation of doxonomics: differential exposure to evidence, not irrationality, suffices to produce differential belief. Rational agents in asymmetric information environments will hold different beliefs. The doxonomic question is: who controls the information environments?

Remark 2.21. The Bayesian model assumes agents are rational updaters. In practice, agents also exhibit motivated reasoning (updating asymmetrically depending on whether evidence confirms or threatens identity), confirmation bias (seeking evidence consistent with prior beliefs), source credibility weighting (discounting evidence from distrusted sources regardless of content), and bounded attention (processing only a fraction of available information). Each of these makes the doxonomic effect *stronger* than the pure Bayesian model predicts: biased exposure combined with biased processing produces faster and more durable divergence.

2.7 Operationalizing the Invisible: How to Detect Doxa

The deepest doxonomic products are, by definition, hard to see. If a proposition is truly doxic (invisible as a claim), how does the researcher identify it?

Several heuristic methods are available:

1. **Premise analysis**: search large corpora for propositions that appear overwhelmingly as unstated premises rather than as explicit conclusions. If "economic growth is desirable" appears in 10,000 texts as a background assumption but is explicitly argued for in only 50, it is behaving doxically.
2. **Contrast with other societies**: propositions that are doxic in one society but explicitly debated in another are candidates for doxonomic analysis. The assumption that health care is a market commodity is doxic in the United States but explicitly contested in most European countries.

3. **Historical discontinuity**: if a proposition was once explicitly argued for (with named advocates and institutional campaigns) but is now "just how things are," the transition from argument to doxa is itself a doxonomic achievement worth tracing.
4. **Anomaly response**: observe how institutions respond when someone challenges a doxic proposition. If the response is not counter-argument but *confusion, dismissal, or ridicule* ("that's just how the world works"), the proposition is likely doxic.
5. **Cross-domain consistency**: if the same anthropological assumption appears in economics, management, law, media, and everyday speech without any of these domains citing the others, it has achieved the kind of distributed invisibility characteristic of doxa.

Exercise 2.1. Apply the five heuristic methods above to the proposition "economic growth is the primary objective of government." For each method, describe what evidence you would look for and what a positive finding would indicate.

2.8 Notes and References

The taxonomy of belief, ideology, and common sense draws on Gramsci (1971), Bourdieu (1984), and Foucault (1981). The social construction of reality as a general framework is developed in Berger and Luckmann (1966); the sociology of knowledge as a discipline originates with Mannheim (1936). Althusser (1971) provides a structural account of how institutions reproduce ideology through ideological state apparatuses.

Pluralistic ignorance was formalized by Kuran (1995). The game-theoretic structure of public belief connects to coordination games in Schelling (1978). On cognitive dissonance and belief maintenance under contradictory evidence, see Festinger (1957). Cultural cognition and identity-protective reasoning are developed in Kahan et al. (2012) and Mercier and Sperber (2017). Social identity theory is foundational for understanding how group affiliation structures belief (Tajfel and Turner 1979).

Bayesian updating under asymmetric information exposure is treated in Gentzkow and Shapiro (2010). The concept of anthropological regimes extends Gintis et al. (2005). On epistemic injustice (how social power shapes who is heard and believed), see Fricker (2007) and Medina (2013). The layered ontology draws on Bourdieu's habitus, Hall (1980) on encoding/decoding, and the pragmatist tradition of Dewey (1927). On the relation between truth and power in social analysis, see Mannheim (1936) and Jasanoff (2004). On performativity (the way models and descriptions can remake the reality they claim to describe), see MacKenzie (2006).

The operationalization of doxa through corpus analysis connects to methods in Chapter 17. For mass opinion formation as a multi-layered process, see

Zaller (1992). On propaganda as a total social phenomenon rather than merely a state tool, see Ellul (1965).

2.9 Exercises

Exercise 2.2. Give a formal example of pluralistic ignorance using a coordination game with n players. Show that an equilibrium exists in which all players publicly affirm p despite privately doubting it. Compute the critical mass k^* of dissenters needed to collapse the equilibrium as a function of the conformity parameter c.

Exercise 2.3. Consider two populations exposed to different evidence streams ν_A and ν_B about human cooperation. Using Bayes' rule, show that after T periods their posterior beliefs on "human nature is selfish" diverge by an amount proportional to the KL divergence $D_{\mathrm{KL}}(\nu_A \| \nu_B)$. What happens when $T \to \infty$?

Exercise 2.4. Classify the following as opinion, belief, ideology, common sense, or doxa in contemporary Western societies: (a) "hard work leads to success," (b) "the earth orbits the sun," (c) "economic growth is good," (d) "taxation is theft," (e) "a person's worth is measured by their productivity," (f) "democratic elections are the legitimate way to choose leaders." Justify each classification using the formal definitions above. For any that you classify as common sense or doxa, describe what institutional apparatus maintains them.

Exercise 2.5. For the belief "inequality is a natural consequence of differences in talent and effort," identify how this belief operates at each of the five layers of the layered ontology. At which layer is it most deeply embedded? At which layer would intervention be most effective?

Exercise 2.6. Formalize the self-fulfilling property of anthropological regimes. Let institutions design rules based on regime α, and let agents respond to those rules. Under what conditions does the observed behavior confirm α regardless of the "true" human nature? (Hint: model this as a game where the institutional designer chooses a mechanism based on α, and agents best-respond.)

Exercise 2.7. Compute the coherence strength $\kappa(\mathcal{P})$ for a hypothetical ideology with five propositions. Suppose that beliefs in p_1 and p_2 are highly correlated ($r = 0.8$), p_3 and p_4 are moderately correlated ($r = 0.4$), and all other pairs are uncorrelated ($r = 0$). What is κ? Is this a "strong" ideology by your measure?

Exercise 2.8. Choose a proposition you suspect is doxic in your society. Apply at least three of the five heuristic detection methods from Section 2.7. Report what you find. If the proposition turns out to be common sense rather than doxa, explain what evidence would distinguish the two.

CHAPTER 3

A Brief Prehistory of Doxonomics

> The philosophers have only interpreted the world, in various ways; the point is to change it.
>
> Karl Marx, *Theses on Feuerbach* (1845)

Doxonomics is new as a named discipline. But the insight that beliefs are shaped by material power is ancient. This chapter traces the intellectual lineage, extracting from each predecessor the formal insight that doxonomics inherits. The genealogy is not meant to be exhaustive. It is organized around the question: *who saw the conversion problem, and what tools did they develop to analyze it?*

3.1 Sophists and the Market for Persuasion

The Greek sophists were, in effect, the first consultants in belief production. Protagoras, Gorgias, Thrasymachus, and their colleagues sold rhetorical skill, the capacity to make the weaker argument appear stronger. They charged fees. They competed for students and patrons. They were, in modern terms, a market for persuasion services.

Plato attacked them for it, famously in the *Gorgias* and the *Republic*. His objection was that rhetoric separated persuasion from truth: the sophist could make any proposition plausible, regardless of its accuracy, provided the audience was susceptible and the speaker was skilled. This is already a proto-doxonomic critique.

Remark 3.1. The sophists reveal the first doxonomic principle: *the ability to shape belief is an economic good with a market price.* In modern notation,

there exists a market-clearing price p^* for persuasion services, which implies that wealthier actors can purchase more belief-shaping capacity, a precursor to the concept of epistemic capital ($\mathcal{E}$). The Platonic response (that truth should govern belief) is the normative position that doxonomics, as a descriptive science, neither endorses nor rejects but takes as a benchmark against which to measure distortion.

What the sophists lacked was a structural analysis. They understood individual persuasion. They did not theorize the institutional systems by which persuasion becomes common sense across an entire polity.

3.2 Hobbes, Mandeville, and the Construction of Selfish Anthropology

Hobbes (1651) proposed that the natural condition of humanity is a war of all against all, requiring absolute sovereignty to impose order. Mandeville (1714) argued in *The Fable of the Bees* that private vices produce public benefits. Selfishness is not only natural but socially productive, and attempts to enforce virtue would impoverish society.

These are not merely philosophical positions. They are *anthropological regimes* (Definition 2.12) whose institutional installation required centuries of work: in political theory, in economics curricula, in management doctrine, in legal reasoning. By the late twentieth century, the Hobbesian-Mandevillean anthropology had become operational common sense in most Western institutions, not because it won a philosophical argument, but because it was embedded in the design of markets, contracts, incentive systems, and governance structures.

Remark 3.2. The doxonomic question about Hobbes is not "was he right?" but "what institutional investment was required to make his anthropology the default assumption of modern governance, and what alternative anthropologies were crowded out in the process?" Bowles and Gintis (2011) and Ostrom (1990) provide evidence that the crowded-out alternatives had substantial empirical support.

Smith (1776) occupies an ambiguous position. The *Wealth of Nations* is routinely cited as a founding text of the self-interest paradigm ("It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner"). But Smith also wrote *The Theory of Moral Sentiments* (1759), which grounds human sociality in sympathy, fellow-feeling, and the desire for mutual recognition. The selective amplification of Smith-as-self-interest-theorist, and the suppression of Smith-as-moral-philosopher, is itself a doxonomic achievement, one that McCloskey (2006) has documented in detail.

3.3 Marx: Ideology as Material Production

Marx and Engels (1846) proposed the most radical version of the thesis: the ruling ideas of any epoch are the ideas of the ruling class, produced not by the force of argument alone but by control over the means of mental production. In the same way that the class which owns the factories controls the production of goods, it also controls, through ownership of newspapers, publishing houses, universities, and churches, the production of ideas.

Principle 3.3 (Marxian Doxonomic Principle)**.** The class that controls the means of material production simultaneously controls the means of intellectual production. In doxonomic terms: the funding vector $\boldsymbol{F}$ is not exogenous but is determined by the distribution of economic power. Formally, let W be the wealth distribution and $\boldsymbol{F} = g(W)$ for some function g that maps material power to doxonomic investment. If g is monotonically increasing (wealthier actors invest more in belief production), then doxonomic output is structurally biased toward the interests of the wealthy.

Marx's contribution to doxonomics is threefold:

1. the recognition that ideas have material conditions of production,
2. the claim that the content of dominant ideas systematically reflects the interests of dominant groups,
3. the concept of ideology as *false consciousness*: beliefs that serve the interests of the powerful while being experienced by the powerless as their own convictions.

His limitation, from a doxonomic standpoint, was insufficient formalization and insufficient attention to the mechanisms of belief transmission. Marx knew *that* ideas served class interests; he did not provide the accounting tools to trace *how much* was spent, *through which institutions*, with *what measurable effects*. He also underestimated the autonomy of institutional processing: ideas are not simply piped from the ruling class to the population but are transformed, filtered, and repackaged by intermediary institutions with their own logics.

Althusser (1971) partially addressed this with the concept of *ideological state apparatuses*: schools, churches, media, family, and legal systems that reproduce ideology not through direct coercion but through daily institutional practice. In doxonomic terms, Althusser identified the institutional ecology $\mathcal{I}$ as a set of belief-processing functions that operate with relative autonomy from direct class instruction.

3.4 Gramsci: Hegemony

Gramsci (1971) introduced *hegemony*: the process by which a ruling group secures consent not through coercion but through cultural and intellectual leadership. Hegemony operates through civil society (schools, churches, media,

professional associations, cultural institutions) rather than through the state alone.

Gramsci's key innovation was the recognition that domination through belief is *more effective and more durable* than domination through force. A state that relies on police is fragile; a state whose citizens genuinely believe that the existing order is natural, just, or inevitable barely needs police at all.

In doxonomic terms, Gramsci's contribution is the recognition that $\mathcal{I}$ (the institutional ecology) is the primary site of belief production, and that durable power requires not just force but narrative infrastructure $\mathcal{N}$. He also introduced a crucial dynamic concept: hegemony is never total, always contested, and must be continuously *renewed* through institutional work. This anticipates the doxonomic concept of maintenance cost: even a captured belief requires ongoing investment to remain dominant.

Remark 3.4. Gramsci also theorized *counter-hegemony*: the construction of alternative common sense by subordinate groups through their own institutional networks (workers' councils, alternative media, pedagogical movements). This prefigures the counter-doxonomic strategies of Chapter 32.

3.5 Lippmann and Dewey: The Public Opinion Debate

In the 1920s, two American thinkers framed a debate that remains central to doxonomics.

Lippmann (1922) argued in *Public Opinion* that ordinary citizens are incapable of understanding the complexity of modern governance. They perceive the world through "stereotypes," simplified pictures in their heads, produced by media and institutional sources rather than by direct experience. Public opinion is therefore not the spontaneous expression of citizen judgment but a *manufactured product*, shaped by those who control the information environment.

Lippmann's doxonomic insight: the production function Φ is controlled by a relatively small number of institutional actors (editors, publishers, experts, officials), and the population's beliefs are the *output* of this function, not its independent input.

Dewey (1927) responded in *The Public and Its Problems* that the solution was not technocratic management of opinion (Lippmann's implicit conclusion) but the *democratization of communication*. If the public is poorly informed, the remedy is not to hand belief production to experts but to create institutional conditions (free media, public education, open deliberation) under which citizens can form genuine judgments.

Remark 3.5. The Lippmann-Dewey debate maps directly onto a tension within doxonomics. Lippmann's position leads to a *diagnostic* doxonomics: mapping

how belief is produced by elites and processed by publics. Dewey's position leads to a *constructive* doxonomics: designing institutional environments for democratic belief formation. This book attempts both, but the tension is real and unresolved. Chapter 33 returns to it.

3.6 Bernays: Engineering Consent

Bernays (1928) made the conversion problem explicit. Drawing on his uncle Freud's psychology, Bernays developed techniques for converting corporate funding into public opinion: the staged event, the third-party endorsement, the appeal to unconscious desire, the manipulation of group psychology.

His 1929 "Torches of Freedom" campaign (in which he hired women to smoke cigarettes in the New York Easter Parade, framing smoking as a feminist act) is a canonical example of doxonomic engineering. The client was the American Tobacco Company. The narrative output was "smoking = women's liberation." The channel was news media (journalists covered the stunt as a news event, lending it third-party credibility). The behavioral consequence was a measurable increase in women's smoking.

Remark 3.6. Bernays is the first explicit *doxonomic engineer*: a practitioner who consciously understood and optimized the production function $\Phi : \mathbb{R}^m_{\geq 0} \times \mathcal{I} \to \mathcal{N}$. Public relations, as he conceived it, is applied doxonomics, the deliberate, funded transformation of institutional inputs into belief outputs. His candor was remarkable. The opening of *Propaganda*: "The conscious and intelligent manipulation of the organized habits and opinions of the masses is an important element in democratic society. Those who manipulate this unseen mechanism of society constitute an invisible government which is the true ruling power of our country."

Ellul (1965) extended this analysis. Where Bernays focused on technique, Ellul argued that propaganda is not merely a tool used by states or corporations but a *total social phenomenon*: modern societies produce propaganda as naturally as they produce consumer goods, because the complexity of modern life creates a demand for simplified interpretive frameworks that only organized narrative production can supply. In doxonomic terms, Ellul's point is that the demand side of the conversion problem is endogenous: complex societies create the audience conditions under which doxonomic production becomes effective.

3.7 The Frankfurt School: Culture Industry

Adorno and Horkheimer (1944) introduced the concept of the *culture industry*: the industrial-scale production of cultural goods (film, music, radio, magazines) that standardize consciousness and integrate populations into the existing order.

The Frankfurt School's doxonomic insight was that *entertainment is a channel of belief production*, not merely a diversion from it. A Hollywood film that represents success as individual achievement, romance as consumption, and conflict as resolved through violence is producing an anthropological regime, not by arguing for it but by *narrating* it as the natural shape of human life.

In doxonomic terms, the culture industry operates at layers 3–5 of the layered ontology (Principle 2.14): practical schemas, identity commitments, and affective orientations. It shapes not what people explicitly believe but what they desire, expect, fear, and find normal. This makes it both more powerful and harder to trace than propositional propaganda.

The limitation of the Frankfurt School, from a doxonomic standpoint, was a tendency toward totalization: the culture industry was presented as so pervasive that resistance seemed impossible. Later work (by Stuart Hall, the Birmingham cultural studies tradition, and audience reception theorists) showed that audiences are not passive consumers but active interpreters who negotiate, resist, and reinterpret cultural products (Hall 1980).

3.8 Foucault: Discourse, Power, and the Production of Truth

Foucault (1981) shifted attention from who speaks to the *rules of discourse*: the conditions under which a statement counts as knowledge, who is authorized to make it, and what institutional apparatus validates it.

In Foucault's analysis, power does not merely suppress truth; it *produces* truth. Each society has its "regime of truth": the types of discourse it accepts as true, the mechanisms that enable one to distinguish true from false statements, the techniques for acquiring truth, and the status of those who are charged with saying what counts as true.

In doxonomic terms, Foucault's contribution is the insight that C_k is not a fixed property of a channel but is itself socially produced. The rules determining what counts as expertise, evidence, or common sense are themselves objects of doxonomic investment. This is the fourth dimension of doxonomic power (Definition 9.1 in Chapter 9): the power to shape the meta-rules of belief evaluation.

Remark 3.7. Foucault pushes doxonomics toward a second-order analysis. The first-order model asks: how are beliefs produced? The Foucauldian question asks: how are the *rules for evaluating beliefs* produced? Who decides what counts as evidence, what counts as expertise, what counts as a reasonable question? These meta-rules are themselves doxonomic products, and among the most consequential ones. A society that controls the definition of "science," "expert," and "evidence" controls the credibility weights C_k for all channels simultaneously.

3.9 Bourdieu: Symbolic Power, Doxa, and Reproduction

Bourdieu (1984) and Bourdieu (1991) provided the richest pre-doxonomic framework. His contributions map onto doxonomic concepts with unusual precision:

Bourdieu	**Doxonomics**
Symbolic capital	Epistemic capital $\mathcal{E}$
Doxa	Common-sense capture (Definition 2.6)
Field	Institutional ecology $\mathcal{I}$
Habitus	Practical schema (layer 3)
Cultural reproduction	Belief production chain $\mathcal{B}$
Misrecognition	Invisible as a claim (doxa condition 4)

Bourdieu's analysis of the educational system as a reproduction mechanism is particularly relevant. In *Distinction*, he showed that the French educational system does not merely transmit knowledge; it converts inherited economic capital into credentialed cultural capital, laundering class privilege through the appearance of meritocratic achievement. The school system is simultaneously an institution that produces knowledge and an institution that produces the *belief* that the knowledge hierarchy reflects natural differences in ability.

What Bourdieu lacked was the accounting machinery. He showed that symbolic power reproduces itself through institutions but did not build the input-output tables, trace the funding flows, or estimate the conversion rates. Doxonomics inherits his sociology and adds the ledger.

3.10 Herman and Chomsky: The Propaganda Model

Herman and Chomsky (1988) provided the most systematic media-level doxonomic model. The propaganda model identifies five "filters" through which media content passes before reaching the public:

1. **Ownership**: media corporations are owned by large conglomerates with interests in maintaining the status quo.
2. **Advertising**: the primary revenue source for most media, giving advertisers structural influence over content.
3. **Sourcing**: dependence on official sources (government, corporate PR) for raw material.
4. **Flak**: organized campaigns to discredit or punish media that deviate from acceptable narratives.

5. **Ideology**: shared assumptions (anticommunism in the original formulation; market fundamentalism in later versions) that frame what counts as newsworthy.

In doxonomic terms, the five filters are structural parameters of the narrative infrastructure $\mathcal{N}$ that systematically bias output without requiring any explicit conspiracy. The propaganda model's great strength is that it is *testable*: it generates predictions about which stories will be covered, how they will be framed, and which perspectives will be excluded, based on structural properties of the media system rather than on the intentions of individual journalists.

Its limitation is its focus on media. Doxonomics extends the same structural logic to the full institutional landscape: education, think tanks, platforms, professional training, entertainment, and the built environment.

3.11 Colonial Knowledge Production

The most large-scale doxonomic operations in history were not conducted by think tanks or advertising agencies. They were conducted by colonial empires, which invested enormous resources in producing knowledge systems (racial taxonomies, civilizational hierarchies, linguistic classifications, legal codes) that justified extraction and governance.

Said (1978) showed that "Orientalism" was not merely prejudice but an institutionally sustained body of knowledge: endowed chairs at universities, specialized journals, government translation offices, and training programs for colonial administrators, all dedicated to producing authoritative accounts of the colonized world. The narrative infrastructure was vast: the British Indian Civil Service alone trained thousands of administrators in a specific interpretive framework for understanding "the Oriental mind."

Fanon (1961) analyzed the internalization stage: how colonial education systems replaced indigenous knowledge with the colonizer's worldview, producing subjects who internalized their own subordination. The colonial school taught not just the colonizer's language but the colonizer's anthropology: the belief that European civilization was the pinnacle of human achievement, that indigenous cultures were backward, and that colonial rule was a civilizing mission.

In doxonomic terms, colonialism built the most extensive narrative infrastructure $\mathcal{N}$ in pre-digital history, reaching hundreds of millions through missionary schools, colonial administration, and restructured legal systems. The persistence of these narratives after formal decolonization (what decolonial theorists call *coloniality*) is a doxonomic phenomenon: the institutional infrastructure outlasts the political regime that built it. Chapter 25 develops this analysis.

3.12 The Digital Turn: Platforms as Doxonomic Infrastructure

The early twenty-first century introduced a qualitative shift in doxonomic infrastructure. Social media platforms (Facebook, YouTube, Twitter/X, TikTok) became simultaneously:

- *channels* of narrative circulation (reaching billions),
- *institutions* of narrative processing (algorithmic curation decides what is amplified),
- *data-collection systems* that enable micro-targeted doxonomic operations (personalized belief exposure based on behavioral profiles).

Zuboff (2019) analyzed this as "surveillance capitalism": the extraction and commodification of behavioral data for predictive and manipulative purposes. In doxonomic terms, platforms represent a new kind of narrative infrastructure in which the exposure matrix E (who sees what) is not determined by editorial judgment or public policy but by engagement-maximizing algorithms whose objective function is revenue, not truth or public welfare.

This makes the conversion problem both easier and harder to study. Easier, because platform advertising data provides unprecedented visibility into doxonomic spending (Meta's Ad Library, Google's Transparency Report). Harder, because algorithmic curation operates at a speed and granularity that traditional doxonomic accounting cannot yet match.

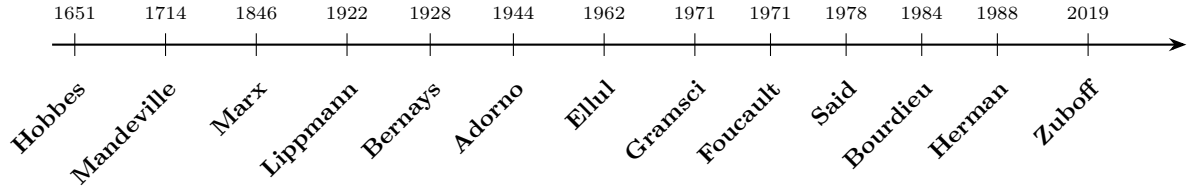
3.13 Synthesis: What Doxonomics Inherits

Each predecessor contributed a piece. Doxonomics assembles them:

Predecessor	Doxonomic Inheritance
Sophists	Persuasion is a priced good; $\mathcal{E}$ has a market.
Hobbes/Mandeville	Anthropological regimes are installed, not discovered.
Marx	$\boldsymbol{F}$ is endogenous to the wealth distribution.
Althusser	$\mathcal{I}$ operates with relative autonomy from direct class instruction.
Gramsci	Durable power requires $\mathcal{N}$, not just coercion; hegemony must be continuously renewed.
Lippmann	Φ is controlled by a small number of institutional actors.
Dewey	The remedy is democratized communication, not technocratic management.
Bernays	Applied doxonomics: optimizing Φ for commercial and political clients.
Ellul	Demand for simplified belief is endogenous to social complexity.
Frankfurt School	Entertainment is a doxonomic channel operating at layers 3–5.
Foucault	C_k is itself socially produced (second-order doxonomics).
Bourdieu	Symbolic capital, doxa, reproduction: the richest pre-doxonomic vocabulary.
Herman/Chomsky	Structural filters produce systematic bias without conspiracy.
Said/Fanon	Colonial empires built the largest pre-digital $\mathcal{N}$ in history.
Zuboff	Platforms as algorithmic doxonomic infrastructure with micro-targeting.

What none of these predecessors provided, and what doxonomics aims to build, is a *unified formal framework* that integrates accounting, network analysis, causal inference, measurement, and dynamical modeling into a single disciplinary structure. The tools exist in scattered form across economics, sociology, media studies, and computer science. The task of this book is to assemble them.

3.14 A Timeline



3.15 Notes and References

On the sophists and rhetoric, see Plato's *Gorgias* and *Republic*. Hobbes (1651) and Mandeville (1714) establish the selfish anthropology; on its selective amplification, see McCloskey (2006). Marx and Engels (1846) is the foundational text on ideology as material production; Althusser (1971) develops the institutional apparatus. Gramsci (1971) develops hegemony and counter-hegemony. Lippmann (1922) and Dewey (1927) frame the public-opinion debate. Bernays (1928) codifies propaganda technique; Ellul (1965) extends it to a total social phenomenon. Adorno and Horkheimer (1944) develops the culture industry concept. Foucault (1981) restructures the analysis of discourse and truth-production. Bourdieu (1984) and Bourdieu (1991) provide the symbolic-power framework. Herman and Chomsky (1988) extends these ideas into a testable media model. Said (1978) and Fanon (1961) analyze colonial knowledge production. Zuboff (2019) diagnoses platform-mediated surveillance capitalism. On the institutional history of neoliberalism as a doxonomic project, see Mirowski and Plehwe (2009), Mayer (2016), and Slobodian (2018). Stanley (2015) provides a recent philosophical analysis of propaganda in democratic societies. Hall (1980) on encoding/decoding introduced the concept of negotiated readings that resist the dominant code.

3.16 Exercises

Exercise 3.1. For each thinker in this chapter, state the corresponding doxonomic concept from the formal framework of Chapter 1 (e.g., Marx $\rightarrow$ endogenous $\boldsymbol{F}$; Bernays $\rightarrow$ applied optimization of Φ).

Exercise 3.2. Bernays staged the "Torches of Freedom" campaign (1929) to associate women's smoking with feminist liberation. Analyze this as a doxonomic operation: identify F_k, C_k, $R_{k,i}$, P_k, and T_k. Was the campaign operating at layer 1 (propositional belief) or at deeper layers?

Exercise 3.3. Compare Foucault's "order of discourse" with the concept of credibility weights C_k. In what sense does Foucault's analysis go beyond the first-order model? Write down a second-order model in which C_k is itself

produced by a meta-level doxonomic system, and discuss the implications for measurement.

Exercise 3.4. The propaganda model identifies five structural filters. For each filter, write the corresponding formal constraint on the production function Φ or the narrative space $\mathcal{N}$. Which filters are most affected by the transition from legacy media to platform-based media?

Exercise 3.5. Choose a colonial education system (e.g., British India, French West Africa, Belgian Congo). Reconstruct its belief production chain. How did it differ from the neoliberal chain described in Example 1.5? What institutional features made colonial belief production particularly durable?

Exercise 3.6. The chapter presents the Lippmann-Dewey debate as mapping onto a tension between diagnostic and constructive doxonomics. Is it possible to practice both simultaneously, or does the diagnostic stance ("belief is manufactured") undermine the constructive stance ("democratic belief formation is possible")? Argue your position.

Exercise 3.7. Identify a doxonomic insight from a tradition *not* covered in this chapter, for example from Islamic jurisprudence, Confucian statecraft, Buddhist epistemology, or indigenous knowledge systems. State the insight in formal doxonomic language.

CHAPTER 4

Core Units of Analysis

> All models are wrong, but some are useful.
>
> George E. P. Box

Doxonomics requires a precise vocabulary of parts. Before we can model how beliefs are produced, we need formal definitions of the entities involved: who produces belief, through what institutional machinery, via which channels, with what resources, carrying what content, reaching which audiences, and feeding back into what structures.

This chapter defines seven core units (agents, institutions, channels, budgets, narratives, audiences, and feedback loops) and gives each a mathematical specification. Together they constitute the component library from which doxonomic systems are assembled.

4.1 Agents

Definition 4.1 (Doxonomic Agent)**.** A *doxonomic agent* is an entity $a \in \mathcal{A}$ characterized by:

- a *type* $\tau(a) \in \{\text{funder}, \text{institution}, \text{intermediary}, \text{audience member}\}$,
- a *resource endowment* $r(a) \in \mathbb{R}_{\geq 0}$,
- a *belief state* $\pi_a \in \Delta(\Omega)$ (a probability distribution over propositions),
- a *strategic objective* $u_a : \mathcal{B} \to \mathbb{R}$ (a utility function over population-level belief states).

The four types play structurally different roles:

Funders allocate resources to channels. They have preferences about what the population believes, preferences that may be ideological (a foundation promoting free-market ideas), commercial (a corporation promoting consumerism),

or governmental (a state promoting national identity). Their strategic problem is: given budget $r(a)$, how to allocate across channels to maximize $u_a(\boldsymbol{B})$.

Institutions process funding into narrative outputs. They are the factories of belief production: universities, think tanks, media organizations, PR firms, religious organizations, government agencies. Their output depends not only on funding but on their internal norms, personnel, accumulated credibility, and organizational culture.

Intermediaries amplify, filter, translate, or repackage narratives as they move through the system. A journalist who writes up a think-tank report, a social media influencer who popularizes an academic finding, a textbook author who translates research into pedagogical material: each is an intermediary who transforms the narrative in the process of transmitting it.

Audience members receive, interpret, and may resist or adopt narratives. They are not passive. They bring prior beliefs, identity commitments, lived experience, and cognitive resources to the encounter with any narrative. The same narrative may persuade one audience segment and provoke backlash in another.

Remark 4.2. In practice, agents often occupy multiple roles simultaneously. A university professor is both an institution (producing research) and an intermediary (translating it for students) and an audience member (consuming media). The type classification is analytical, not existential: it describes the *role* an agent plays in a specific doxonomic transaction, not a permanent identity.

The key structural asymmetry is that funders optimize over $\mathcal{B}$ (they have preferences about what the population believes and resources to act on those preferences), while audience members are typically modeled as updating agents without strategic control over the information environment. This asymmetry is the source of doxonomic power.

Example 4.3 (Agent Asymmetry in Climate Discourse). In the climate-belief system:

- **Funders**: fossil fuel companies (ExxonMobil, Koch Industries) invested hundreds of millions in climate-doubt production (Oreskes and Conway 2010).
- **Institutions**: think tanks (Heartland Institute, Global Warming Policy Foundation) processed funding into contrarian research, op-eds, and congressional testimony.
- **Intermediaries**: cable news producers, op-ed editors, and social media algorithms amplified doubt narratives.
- **Audience**: the general public, which by 2010 was significantly more skeptical about climate change than the scientific consensus warranted.

The funding asymmetry: the fossil fuel industry's doxonomic budget for climate doubt dwarfed the combined science-communication budgets of all climate

research institutions. This did not make the doubt narrative *true*; it made it *ubiquitous*.

4.2 Institutions as Belief-Processing Functions

Institutions are the central machinery of doxonomic production. They are not mere conduits; they *transform* inputs. A think tank does not simply relay its donor's wishes. It translates them into credentialed, publishable, quotable form, adding the epistemic capital that makes the output persuasive.

Definition 4.4 (Institutional Processing Function)**.** An institution $\iota \in \mathcal{I}$ is a function

$$\iota : \mathbb{R}_{\geq 0} \times \mathcal{N}_{\text{in}} \to \mathcal{N}_{\text{out}} \times [0, 1]$$

mapping a funding level and input narrative material to an output narrative and a credibility multiplier. The credibility multiplier reflects the institution's accumulated epistemic capital $\mathcal{E}(\iota)$.

The processing function captures three things:

1. **Content transformation**: the input (a donor's policy preference) becomes output (a research paper, a textbook chapter, an op-ed). The content may be identical, but the form is different, and form determines doxonomic force.
2. **Credibility attachment**: the institutional brand is affixed to the output. "A study by the Heritage Foundation" and "a study by Harvard" carry different credibility weights, even if the methodology is identical.
3. **Audience routing**: different institutions have access to different distribution networks. A think tank's output reaches policymakers and journalists; a university's output reaches students and academics; an advertising agency's output reaches consumers.

Example 4.5 (Credibility Differential). A think tank ι receives funding $F_k =$ \$2M/year and raw policy positions from its donors. It outputs research papers, op-eds, and expert testimony. Its credibility multiplier $C_\iota = 0.7$ reflects its reputation among journalists and policymakers. A university economics department performing similar work might have $C_{\iota'} = 0.9$. The difference in C means the same proposition, backed by the same evidence, has different doxonomic force depending on its institutional origin.

This credibility differential is what makes *credibility laundering* possible: a low-credibility funder channels money through a high-credibility institution, gaining the credibility premium without producing the underlying quality. The institution's brand is the product being purchased.

Definition 4.6 (Institutional Capacity)**.** The *capacity* of an institution ι is the maximum narrative throughput it can produce per unit time:

$$\Theta^{\max}(\iota) = \max_{F} \{P_\iota(F) \cdot C_\iota \cdot T_\iota\}$$

Capacity depends on staffing, infrastructure, accumulated expertise, and institutional reputation. It cannot be created instantly: building a credible institution takes years or decades, which is why doxonomic systems exhibit strong path dependence.

Remark 4.7 (Institutional Autonomy). Institutions are not perfectly obedient to their funders. A university department funded by a corporation may produce research that contradicts the funder's preferences. A media outlet owned by a billionaire may employ journalists who resist editorial direction. This relative autonomy is an important feature, not a bug, of the model: it means the production function ι has its own internal logic that may partially resist the input signal. The degree of institutional autonomy varies: a PR firm has near-zero autonomy (it produces what the client wants); a tenured university department has considerable autonomy (funding affects what is studied, not necessarily what is concluded).

4.3 Channels

Channels are the transmission media through which institutional outputs reach audiences. Each channel has characteristic properties that determine its doxonomic profile.

Definition 4.8 (Doxonomic Channel)**.** A *channel* is a medium of narrative transmission characterized by:

- *reach* $P_k \in [0, 1]$: the fraction of the population exposed per unit time,
- *credibility* $C_k \in [0, 1]$: the weight audiences assign to messages from this channel,
- *persistence* $T_k \in \mathbb{R}_{>0}$: the half-life of the narrative in audience memory,
- *cost function* $c_k : \mathbb{R}_{\geq 0} \to [0, 1]$: the mapping from funding to effective reach (typically concave: diminishing returns to spending).

Different channels occupy different regions of the reach-credibility-persistence space:

Education	Low reach/time, high credibility (~ 0.85), very high persistence (∼decades). Shapes foundational priors. Most expensive per-person but most durable.
Prestige Media	Medium reach, high credibility (~ 0.7), medium persistence (∼months). Sets the daily agenda for elites and opinion leaders.
Broadcast Media	High reach, medium credibility (~ 0.5), low persistence (∼days). Mass exposure with high turnover.
Social Media	Very high reach, low credibility (~ 0.2), very low persistence (∼hours). Amplifies, fragments, and accelerates.
Think Tanks	Low direct reach, high credibility in policy circles (~ 0.75), medium persistence. Produces expert legitimacy for policy narratives.
Entertainment	High reach, low perceived persuasive intent, medium persistence. Operates at layers 3–5: normalizes through representation and affect.
Peer Networks	Variable reach (local), high credibility (~ 0.8), high persistence. Most resistant to top-down manipulation but most responsive to social proof.

Remark 4.9 (The Credibility-Reach Tradeoff). There is a general tradeoff between credibility and reach. Channels with high credibility (education, peer networks) tend to have limited reach per unit time. Channels with high reach (broadcast, social media) tend to have lower credibility. This tradeoff shapes doxonomic strategy: a funder seeking deep belief change (commonsense capture) must invest in high-credibility, high-persistence channels; a funder seeking temporary opinion shifts (e.g., before an election) can rely on high-reach, low-persistence channels.

Definition 4.10 (Channel Portfolio)**.** A *channel portfolio* for belief i is the set of channels through which funding is directed, together with the allocation across them: $\{(k, F_k)\}_{k \in K_i}$ where $K_i \subseteq \{1, \ldots, m\}$. A diversified portfolio spreads investment across multiple channel types to exploit different reach-credibility-persistence profiles simultaneously.

4.4 Budgets as Resource Allocation Vectors

Definition 4.11 (Doxonomic Budget)**.** A *doxonomic budget* for belief i is a vector $\boldsymbol{F}_i = (F_1, \ldots, F_m) \in \mathbb{R}^m_{\geq 0}$ specifying the resource allocation across m channels directed at promoting belief i. The total doxonomic expenditure on i is $F_i = \|\boldsymbol{F}_i\|_1 = \sum_k F_k$.

The budget allocation problem is: given a total expenditure F_i, how should a funder allocate across channels to maximize B_i? This is a constrained optimization problem whose solution depends on the relative cost-effectiveness of each channel.

Proposition 4.12 (Optimal Allocation)**.** *Under the first-order model* (1.1) *with concave cost-reach functions c_k, the optimal allocation satisfies the equimarginal condition:*

$$C_k \cdot R_{k,i} \cdot c_k'(F_k) \cdot T_k = \lambda \quad \textit{for all } k \textit{ with } F_k > 0$$

where λ is the Lagrange multiplier on the budget constraint $\sum_k F_k = F_i$.

Proof. The funder maximizes $B_i = \sum_k F_k \cdot C_k \cdot R_{k,i} \cdot c_k(F_k)/F_k \cdot T_k$ subject to $\sum_k F_k = F_i$ and $F_k \geq 0$. Replacing P_k with $c_k(F_k)$ (the cost-to-reach function) and forming the Lagrangian $\mathcal{L} = \sum_k C_k \cdot R_{k,i} \cdot c_k(F_k) \cdot T_k - \lambda(\sum_k F_k - F_i)$, the first-order condition for interior solutions is $C_k \cdot R_{k,i} \cdot c_k'(F_k) \cdot T_k = \lambda$. Concavity of c_k ensures the second-order conditions are satisfied. □

This is the doxonomic analogue of the equimarginal principle in economics: at the optimum, the marginal belief return per dollar is equalized across all active channels. Channels where the marginal return exceeds λ should receive more funding; channels where it falls below λ should be cut.

Example 4.13 (Budget Allocation: Think Tank vs. Advertising)*.* A funder with $F = \$5\text{M}$ considers two channels:

- Think tank: $C_1 = 0.75$, $T_1 = 10$ years, $c_1(f) = 0.02\sqrt{f}$ (low reach, high credibility).
- Social media advertising: $C_2 = 0.2$, $T_2 = 0.1$ years, $c_2(f) = 0.5\sqrt{f}$ (high reach, low credibility).

The marginal return at funding level f is $C_k \cdot T_k \cdot c_k'(f)$. For the think tank: $0.75 \cdot 10 \cdot 0.01/\sqrt{f} = 0.075/\sqrt{f}$. For advertising: $0.2 \cdot 0.1 \cdot 0.25/\sqrt{f} = 0.005/\sqrt{f}$. The think tank's marginal return is 15 times higher. At the optimum, the funder should invest almost entirely in the think tank, a non-obvious result that reflects the enormous premium of credibility × persistence over raw reach.

Remark 4.14 (Why Doxonomic Budgets Are Hard to Measure)*.* In practice, doxonomic budgets are difficult to estimate because:

- much funding flows through intermediaries (foundations, donor-advised funds) that obscure the ultimate source,

- institutional overhead blurs the distinction between doxonomic spending and general operations,
- some channels (education, entertainment) have doxonomic effects that are side effects of their primary function, not their explicit purpose,
- non-monetary resources (volunteer labor, social media sharing, cultural prestige) contribute to belief production but are not captured in financial accounting.

Chapter 14 develops methods for addressing these measurement challenges.

4.5 Narratives

Narratives are the *content* of doxonomic systems: what institutions produce, channels transmit, and audiences process.

Definition 4.15 (Narrative)**.** A *narrative* $n \in \mathcal{N}$ is a structured proposition or set of propositions equipped with:

1. a *causal claim* ("X because Y"): poverty exists because people don't work hard enough; markets crashed because of government interference; crime rises because of immigration,
2. a *normative framing* ("this is good/bad/natural/inevitable"): inequality is natural; growth is progress; austerity is responsible,
3. a *subject position* (who the audience is invited to identify with): the hardworking taxpayer, the innovative entrepreneur, the responsible citizen.

The same factual content can be embedded in radically different narratives. "Unemployment is at 8%" becomes:

- n_1: "The economy is recovering: unemployment has fallen from 10% to 8%." (Causal: recovery. Frame: progress. Subject: optimistic citizen.)
- n_2: "Eight million people cannot find work, and the government has failed them." (Causal: policy failure. Frame: injustice. Subject: abandoned worker.)
- n_3: "Welfare dependency keeps people from seeking employment." (Causal: moral failure. Frame: personal responsibility. Subject: taxpayer.)

Same statistic, three different doxonomic effects. The narrative, not the fact, is the doxonomic product.

Definition 4.16 (Narrative Distance)**.** Given a vector-space representation of narratives (e.g., via document embeddings), the *narrative distance* between two narratives $n_1, n_2 \in \mathcal{N}$ is

$$d(n_1, n_2) = 1 - \frac{\langle \boldsymbol{v}_{n_1}, \boldsymbol{v}_{n_2} \rangle}{\|\boldsymbol{v}_{n_1}\| \cdot \|\boldsymbol{v}_{n_2}\|}$$

where $\boldsymbol{v}_n$ is the embedding vector of narrative n. Large narrative distance between the dominant frame and an alternative frame indicates that the

alternative is not merely a different opinion but a *different way of seeing*, harder to reach by incremental argument, requiring more doxonomic investment to install.

Remark 4.17 (Narratives vs. Propositions). A narrative is more than a proposition. The proposition "inequality is increasing" has a truth value. The narrative "inequality is increasing because the lazy are being rewarded" has a truth value, a moral judgment, a causal attribution, and a subject position. Doxonomic systems rarely produce naked propositions; they produce narratives, because narratives engage identity, emotion, and action in ways that propositions alone cannot. This is why doxonomic production operates at multiple layers of the ontology simultaneously (Principle 2.14).

4.6 Audiences and Prior Distributions

Audiences are not homogeneous. A population consists of subgroups $\{G_1, \ldots, G_L\}$ with different prior belief distributions μ_{G_l}, different media exposure patterns, different resistance profiles, and different identity commitments. Effective doxonomic strategy requires targeting: knowing which audiences are persuadable and through which channels.

Definition 4.18 (Audience Heterogeneity)**.** The population-level belief B_i is a mixture:

$$B_i = \sum_{l=1}^{L} w_l \cdot B_i^{(l)}$$

where w_l is the population share of group l and $B_i^{(l)}$ is the average credence in group l. A doxonomic system may target some groups more than others.

Definition 4.19 (Audience Resistance)**.** The *resistance* of audience group G_l to narrative n is a function $\rho_l(n) \in [0, 1]$ reflecting the degree to which the group's prior beliefs, identity commitments, lived experience, and critical resources reduce the narrative's doxonomic effect. The effective belief change in group l from exposure to n through channel k is

$$\Delta B_i^{(l)} = (1 - \rho_l(n)) \cdot C_k \cdot R_{k,i} \cdot T_k$$

High resistance ($\rho_l \to 1$) means the group is effectively immune to the narrative; low resistance ($\rho_l \to 0$) means full susceptibility.

Resistance is not random. It is shaped by:

- **Lived experience**: a worker who has been laid off despite "working hard" is more resistant to meritocratic narratives than a comfortably employed professional.

- **Counter-institutions**: groups with access to alternative information sources (unions, community organizations, alternative media) have higher resistance.
- **Identity**: narratives that threaten core identity commitments provoke backlash rather than persuasion (Kahan et al. 2012).
- **Prior exposure**: groups that have been "inoculated" against a narrative (Chapter 32) show elevated resistance to subsequent exposure.

Example 4.20 (Differential Resistance to Meritocratic Narratives). Survey data consistently shows that belief in meritocracy is negatively correlated with direct experience of structural barriers. Black Americans score lower on meritocratic belief scales than white Americans; women in male-dominated workplaces are more skeptical of "effort determines success" than men in the same workplaces; first-generation college students are less convinced of equal opportunity than their legacy peers. In doxonomic terms, lived experience of structural disadvantage raises ρ_l for meritocratic narratives, a form of experiential resistance that no amount of doxonomic investment can fully overcome.

4.7 Feedback Loops

The belief production chain is not unidirectional. Beliefs, once internalized, alter behavior, which alters institutions, which alters funding. This feedback structure is what makes doxonomic systems self-sustaining, and what makes them so difficult to disrupt.

Definition 4.21 (Doxonomic Feedback)**.** A *doxonomic feedback loop* is a dynamical coupling in which the belief state $\boldsymbol{B}(t)$ influences the funding vector $\boldsymbol{F}(t+1)$ through behavioral and institutional responses:

$$\boldsymbol{F}(t+1) = g(\boldsymbol{B}(t), \boldsymbol{F}(t))$$

for some function g. The system is *self-reinforcing* if $\partial g_k / \partial B_i > 0$ for the belief i that channel k promotes. The system is *self-undermining* if $\partial g_k / \partial B_i < 0$ (success reduces future investment).

Example 4.22 (Self-Reinforcing: The Tax Cut Cycle).

1. Think tanks promote the belief that tax cuts stimulate growth (B_T increases).
2. Population supports tax-cutting politicians (behavioral consequence).
3. Tax cuts are enacted; wealthy beneficiaries gain additional disposable income.
4. Beneficiaries donate to the same think tanks (funding increases).
5. Think tanks produce more tax-cut advocacy (B_T increases further).

This is a self-reinforcing loop: $\partial g_k / \partial B_T > 0$. Each iteration strengthens the cycle.

Example 4.23 (Self-Undermining: The Backlash Effect).

1. A corporation promotes the belief that its product is environmentally friendly ("greenwashing").
2. The population initially accepts the claim (B_G increases).
3. Investigative journalists or activists expose the deception.
4. Public trust in the corporation's claims collapses (C_k drops).
5. Further spending on the same message becomes counterproductive.

This is a self-undermining loop: success (increased scrutiny) reduces future effectiveness.

Self-reinforcing feedback is the mechanism by which temporary doxonomic investments become permanent features of a society's common sense. Self-undermining feedback is the mechanism by which doxonomic systems can fail, a topic developed in Chapter 31.

Definition 4.24 (Doxonomic Stability)**.** A doxonomic system is *locally stable* at belief state $\boldsymbol{B}^*$ if small perturbations (temporary counter-narratives, one-time contrary evidence) are absorbed by the feedback structure and the system returns to $\boldsymbol{B}^*$. Formally, $\boldsymbol{B}^*$ is a stable fixed point of the composed dynamical system:

$$\boldsymbol{B}^* = \Psi(\Phi(g(\boldsymbol{B}^*, \boldsymbol{F}^*)), \boldsymbol{B}^*)$$

where Φ is the production function, Ψ is the internalization function, and g is the feedback function.

4.8 Assembling the Units: A Toy Model

To see how the units work together, consider a minimal doxonomic system with one funder, one institution, one channel, and a homogeneous audience.

Model 4.25 (Minimal Doxonomic System)**.**

- Funder: budget F, objective $\max B$.
- Institution: processing function $\iota(F) = (n, C)$ where $C = 0.8$.
- Channel: reach $c(F) = 1 - e^{-F/F_0}$ (saturating), persistence $T = 5$ years.
- Audience: $N = 1000$ agents, prior $\pi_j^{(0)} = 0.3$, Bayesian updating.
- Feedback: $F(t+1) = F_0 + \beta B(t)$ (self-reinforcing with rate β).

The dynamics are:

$$B(t+1) = B(t) + \alpha \cdot C \cdot c(F(t)) \cdot T \cdot (1 - B(t)) - \delta \cdot B(t)$$

where α is the persuasion rate and δ is natural decay.

This system has at most two stable fixed points: a low-belief equilibrium (the narrative fails to take hold) and a high-belief equilibrium (common-sense capture). The basin of attraction depends on the initial funding F_0 and the feedback strength β.

This toy model is developed into a full dynamical framework in Chapters 11 and 5.

4.9 Notes and References

Agent-based models of belief formation draw on Jackson (2008) and Granovetter (1978). The institutional processing framework extends North (1990) on institutions as "rules of the game." On institutional autonomy and the relative independence of cultural production, see Bourdieu (1984). Optimal allocation of persuasion resources connects to Downs (1957) and Tullock (1967). Audience heterogeneity models are treated in Manski (1993); on identity-protective cognition, see Kahan et al. (2012). Feedback loops in social systems are central to Schelling (1978). The climate-doubt example draws on Oreskes and Conway (2010). On the economics of attention as a scarce resource, see Kahneman (2011). Credibility laundering through institutional intermediaries is documented in Mayer (2016). Narrative as a structured object with causal, normative, and identity components draws on framing theory; see Stanley (2015) for a philosophical treatment.

4.10 Exercises

Exercise 4.1. Classify the following as agents, institutions, channels, or narratives: (a) the Koch Foundation, (b) the *New York Times*, (c) Twitter/X, (d) "free markets create prosperity," (e) a university economics department, (f) a YouTube algorithm, (g) a public school curriculum, (h) "hard work is its own reward." Note cases where an entity plays multiple roles.

Exercise 4.2. Compute the optimal budget allocation for a funder with $F_i =$ \$10M across two channels with $C_1 = 0.9$, $C_2 = 0.5$, and cost-reach functions $c_1(f) = \sqrt{f/10^6}$, $c_2(f) = 2\sqrt{f/10^6}$. Assume $R_{k,i} = T_k = 1$ for both. How does the allocation change if $T_1 = 20$ and $T_2 = 0.5$?

Exercise 4.3. Model a self-reinforcing feedback loop in which belief in meritocracy increases tolerance for inequality, which increases political donations from wealthy actors, which increases funding for meritocratic narratives. Write the system as a pair of coupled difference equations and identify the conditions for a stable high-meritocracy equilibrium.

Exercise 4.4. Consider a population with two groups: G_1 (30% of population, high media exposure, low prior credence in p, low resistance $\rho_1 = 0.2$) and G_2 (70%, low media exposure, high prior credence in p, high resistance $\rho_2 = 0.8$). Under what conditions does a doxonomic investment targeting G_1 change the population-level B_i more than one targeting G_2?

Exercise 4.5. For the minimal doxonomic system (Model 4.25), find the fixed points of the dynamics as a function of α, δ, β, F_0, and C. Under what

conditions does only one fixed point exist (inevitable capture or inevitable failure)? Under what conditions do two stable fixed points coexist?

Exercise 4.6. Design a doxonomic system from scratch: choose a belief p, specify funders, institutions, channels, narratives, target audiences, and feedback structure. Estimate plausible values for C_k, P_k, T_k, and ρ_l. Compute the expected B_i using the first-order model. Then identify the weakest link in your system, the point where counter-doxonomic intervention would be most effective.

Exercise 4.7. The chapter notes that entertainment operates at layers 3–5 of the ontology. Choose a popular television series or film franchise and analyze it as a doxonomic channel. What anthropological regime does it normalize? What subject positions does it offer? Estimate its P, C (noting that entertainment credibility works differently from news credibility), and T.

CHAPTER 5

The Belief Production Chain

> It is difficult to get a man to understand something when his salary depends upon his not understanding it.
>
> Upton Sinclair

The previous chapters introduced the components. This chapter assembles them into the central object of doxonomic theory: the *belief production chain*, formalized as a composition of operators.

The belief production chain is to doxonomics what the supply chain is to manufacturing, what the food chain is to ecology, and what the epidemiological chain of infection is to public health. It is the structured sequence through which raw resources become durable public belief. Understanding its stages, their interconnections, and their failure modes is the core analytical task of the field.

5.1 The Chain as Operator Composition

Definition 5.1 (Belief Production Chain)**.** The belief production chain is a composition of six operators:

$$\mathcal{B} = \mathcal{R} \circ \mathcal{B} \circ \mathcal{I} \circ \mathcal{C} \circ \mathcal{P} \circ \mathcal{F}$$

where:

1. $\mathcal{F} : \mathbb{R}^m_{\geq 0} \to \mathbb{R}^m_{\geq 0}$ is the *funding allocation operator*,
2. $\mathcal{P} : \mathbb{R}^m_{\geq 0} \to \bar{\mathcal{N}}$ is the *institutional processing operator*,
3. $\mathcal{C} : \bar{\mathcal{N}} \to \mathcal{N} \times [0,1]^N$ is the *circulation operator* (narrative plus exposure vector),
4. $\mathcal{I} : \mathcal{N} \times [0,1]^N \times \mathcal{B} \to \mathcal{B}$ is the *internalization operator*,

5. $\mathcal{B} : \mathcal{B} \to \mathcal{X}$ is the *behavioral consequence operator* (mapping beliefs to actions),
6. $\mathcal{R} : \mathcal{X} \to \mathbb{R}^m_{\geq 0}$ is the *reproduction operator* (mapping behaviors back to funding).

The full chain maps an initial funding allocation to a new funding allocation via beliefs and behavior. When $\mathcal{B}$ has a fixed point, the doxonomic system is in equilibrium: belief reproduces the conditions of its own production.

Remark 5.2. Each operator is itself a complex process with internal structure. The production function $\mathcal{P}$ is not a single equation but an ensemble of institutions each with its own logic (Chapter 4). The internalization operator $\mathcal{I}$ involves Bayesian updating, motivated reasoning, identity protection, and social conformity simultaneously (Chapter 2). The composition notation $\mathcal{B} = \mathcal{R} \circ \cdots \circ \mathcal{F}$ is a deliberate abstraction: it allows us to reason about the chain's global properties (fixed points, stability, multiplier effects) without specifying the internal structure of each stage. The internal structure is developed in subsequent chapters.

5.2 Stage 1: Funding Allocation

The funding allocation operator $\mathcal{F}$ distributes total resources F across channels according to a strategy σ:

$$\mathcal{F}(F, \sigma) = (F_1, \ldots, F_m) \quad \text{subject to} \quad \sum_k F_k = F$$

The strategy σ may be the solution to the optimization problem in Proposition 4.12, or it may reflect institutional inertia, path dependence, or donor ideology. In practice, most doxonomic funding is not optimally allocated; it follows organizational routines.

Example 5.3 (Funding Strategies). Consider three funders, each with \$10M/year, pursuing the same belief:

- **Optimizer**: allocates using the equimarginal principle, concentrating on high-$C \times T$ channels. Expected belief impact: high.
- **Inertia funder**: allocates the same proportions as last year, regardless of changed conditions. Common in large foundations with entrenched grantmaking patterns.
- **Ideological funder**: allocates based on personal conviction ("I believe in education") rather than cost-effectiveness analysis. May over-invest in a favored channel and under-invest in others.

The gap between the optimizer and the other two is the *allocative inefficiency* of the doxonomic system. Real doxonomic systems are typically far from optimal, which, depending on one's normative position, may be a relief.

Remark 5.4 (The Dark Budget). Not all doxonomic funding is visible. "Dark money" (funding channeled through intermediaries that do not disclose their donors) is a significant fraction of total doxonomic investment in some countries. Mayer (2016) estimates that hundreds of millions of dollars flow annually through donor-advised funds and pass-through foundations in the United States alone, with the ultimate source legally obscured. The funding allocation operator $\mathcal{F}$ is thus partially unobservable, complicating the doxonomic audit. Chapter 14 develops methods for inferring hidden funding from observable outputs.

5.3 Stage 2: Institutional Processing

Each institution ι_k transforms funding and raw material into credentialed narrative output:

$$\mathcal{P}_k(F_k) = (n_k, C_k)$$

where $n_k \in \mathcal{N}$ is the narrative output and $C_k \in [0, 1]$ is its credibility weight.

The processing stage is where raw money becomes persuasive content. A donor's preference for deregulation enters Heritage Foundation as a grant; it exits as a policy brief with citations, data tables, and expert endorsement. The *content* may not change much, but the *form* is transformed from private preference to public-facing knowledge claim.

Proposition 5.5 (Credibility Premium)**.** *If two channels produce the same narrative n but with credibility weights $C_1 > C_2$, then the doxonomic effect satisfies*

$$\Delta B_i(\textit{channel } 1) = \frac{C_1}{C_2} \cdot \Delta B_i(\textit{channel } 2)$$

under the first-order model. High-credibility institutions thus provide a credibility premium*: the same narrative, processed through a prestigious institution, has proportionally greater doxonomic force.*

Example 5.6 (The Credibility Premium in Practice). In 2010, Carmen Reinhart and Kenneth Rogoff published a paper claiming that government debt exceeding 90% of GDP leads to sharply lower growth. The paper was processed through high-credibility channels: Harvard affiliation ($C \approx 0.9$), NBER working paper series, prestigious journal publication. It was cited in congressional testimony, European Commission policy documents, and IMF reports. It justified austerity programs affecting hundreds of millions of people.

In 2013, a graduate student discovered a spreadsheet error that materially changed the results. The corrected analysis showed no sharp threshold at 90%. But by then, the narrative had been internalized: three years of high-credibility circulation had made "90% debt threshold" into policy common sense. The *correction* circulated through lower-credibility channels (a working paper from UMass Amherst) and took years to propagate.

This episode illustrates the credibility premium's asymmetry: high-credibility errors propagate faster and stick longer than lower-credibility corrections.

Definition 5.7 (Processing Loss)**.** The *processing loss* of an institution is the difference between the funder's intended message and the institution's actual output. Formally, if the funder intends narrative n_{in} and the institution produces n_{out}, the loss is $d(n_{\text{in}}, n_{\text{out}})$ in the narrative distance metric (Definition 4.16). Institutions with high autonomy (Remark 4.7) have higher processing loss; institutions with low autonomy (PR firms) have near-zero processing loss. Processing loss is not necessarily undesirable from a social perspective: it is one mechanism by which institutional norms can resist funder capture.

5.4 Stage 3: Circulation

The circulation operator models how narratives reach populations. Let $e_{jk} \in \{0, 1\}$ indicate whether individual j is exposed to channel k. The exposure matrix $E = (e_{jk})_{N \times m}$ determines who hears what.

Definition 5.8 (Exposure Distribution)**.** The *exposure distribution* for belief i is the vector $\boldsymbol{v}_i \in [0, 1]^N$ where

$$v_{i,j} = 1 - \prod_{k=1}^{m} (1 - e_{jk} \cdot R_{k,i})$$

is the probability that individual j encounters at least one narrative relevant to belief i.

The exposure matrix E is the most consequential object in the circulation stage. It determines the information environment of every individual. In the platform era, it is increasingly determined by algorithms rather than by editorial judgment or audience choice.

Definition 5.9 (Exposure Asymmetry)**.** The *exposure asymmetry* for belief i and its negation $\neg i$ is

$$A_j(i) = v_{i,j} - v_{\neg i,j}$$

measuring the degree to which individual j's information environment is skewed toward i. If $A_j(i) > 0$ for most j, the population is in an asymmetric information environment favoring i, the precondition for Bayesian divergence (Proposition 2.20).

Remark 5.10 (Algorithmic Circulation). In pre-digital media systems, the exposure matrix E was determined by geography (which newspapers were available), economics (who could afford a subscription), and editorial decisions

(what was published). These factors produced systematic asymmetries, but they were relatively stable and partially observable.

In platform-mediated circulation, E is determined by engagement-maximizing algorithms that personalize exposure at the individual level. The matrix is no longer stable, observable, or uniform across the population. Each user receives a different information environment, optimized not for truth or public welfare but for attention capture. This makes the exposure asymmetry $A_j(i)$ both larger (more personalized skew) and harder to measure (proprietary algorithms). Chapter 17 discusses methods for partially reconstructing algorithmic exposure.

5.5 Stage 4: Internalization

Internalization is the process by which exposure becomes credence. It is the stage where the doxonomic system meets the individual mind, and where the simplifying assumptions of formal models are most strained.

5.5.1 The Bayesian Baseline

As a first approximation, we model internalization as Bayesian updating:

$$\pi_j^{(t+1)}(p_i) = \frac{\pi_j^{(t)}(p_i) \cdot L_j(e_j \mid p_i)}{\pi_j^{(t)}(p_i) \cdot L_j(e_j \mid p_i) + (1 - \pi_j^{(t)}(p_i)) \cdot L_j(e_j \mid \neg p_i)} \tag{5.1}$$

where L_j is the likelihood function shaped by j's exposure. When exposure is heavily skewed (when j sees many more arguments for p_i than against), the posterior converges toward p_i regardless of the prior.

Conjecture 5.11 (Asymptotic Capture)**.** *Let agent j receive a sequence of conditionally independent signals $(s_1, s_2, \ldots)$ where each s_t supports p_i with probability $q > 1/2$, drawn from a well-specified likelihood model. Assume the agent updates via Bayes' rule, does not discount sources, and does not revise the model itself. Then $\pi_j^{(t)}(p_i) \to 1$ almost surely as $t \to \infty$, regardless of the prior $\pi_j^{(0)}(p_i) > 0$.*

Remark 5.12. The assumptions are strong and worth stating explicitly: conditional independence, well-specified likelihoods, no source discounting, no model revision, no endogenous stopping. In practice, agents discount unfamiliar sources, update models, experience motivated reasoning, and face correlated rather than independent signals. The conjecture identifies an idealized mechanism (asymmetric exposure can overwhelm priors), not a universal law. Repetition alone does not mathematically guarantee capture; it does so only under conditions that doxonomic systems are designed to approximate.

5.5.2 Beyond Bayes: How Real People Internalize

The Bayesian model is a useful benchmark, but real internalization involves several additional mechanisms:

1. **Motivated reasoning**: agents update asymmetrically, weighting evidence that confirms identity-consistent beliefs more heavily than evidence that threatens them (Kahan et al. 2012). In doxonomic terms, motivated reasoning amplifies the effect of identity-aligned narratives and attenuates the effect of identity-threatening ones.
2. **Source credibility weighting**: agents do not treat all sources equally. A message from a trusted in-group member has higher effective C than the same message from an out-group source, regardless of content. This means the credibility weight is not a property of the channel alone but of the *channel* $\times$ *audience* interaction.
3. **Social proof**: agents use perceived peer behavior as evidence. If "everyone seems to believe p," this is treated as independent evidence for p, even when it is not independent but is itself the product of shared doxonomic exposure (Cialdini 2006). Social proof creates a positive feedback loop: doxonomic production increases expressed belief, which increases perceived consensus, which increases genuine belief.
4. **Repetition and mere exposure**: repeated exposure to a claim increases its perceived truth, independent of evidential content, the "illusory truth effect" (Kahneman 2011). This is the most direct mechanism of doxonomic production: sheer volume of exposure substitutes for evidence.
5. **Narrative coherence**: agents are more likely to internalize a proposition that fits into an existing narrative structure (Chapter 2, Definition 2.3). An ideologically bundled proposition benefits from the coherence of the surrounding ideology: accepting one element lowers the threshold for accepting others.
6. **Non-propositional internalization**: at layers 3–5 of the ontology (Principle 2.14), internalization does not involve conscious belief updating at all. Practical schemas are shaped by prolonged immersion, affective orientations by repeated association, identity commitments by social belonging. These processes are slower than propositional updating but more durable.

Model 5.13 (Augmented Internalization)**.** Combining the Bayesian baseline with the mechanisms above, the effective update rule is:

$$\pi_j^{(t+1)}(p_i) = \pi_j^{(t)}(p_i) + \underbrace{\alpha_{\text{Bayes}} \cdot \Delta_{\text{Bayes}}}_{\text{evidence}} + \underbrace{\alpha_{\text{social}} \cdot (\hat{\mu}_j^{(t)} - \pi_j^{(t)})}_{\text{social proof}} + \underbrace{\alpha_{\text{rep}} \cdot v_{i,j}}_{\text{repetition}} - \underbrace{\rho_j(n_i) \cdot |\Delta|}_{\text{resistance}} \tag{5.2}$$

where Δ_{Bayes} is the Bayesian update, $\hat{\mu}_j^{(t)}$ is the perceived social norm, $v_{i,j}$ is exposure intensity, and ρ_j is resistance. The relative weights α determine whether

internalization is primarily evidence-driven, socially driven, or repetition-driven. In most real-world settings, α_{social} and α_{rep} dominate α_{Bayes}.

5.6 Stage 5: Behavioral Consequence

Internalized beliefs alter behavior. Let $x_j \in \mathcal{X}$ be the action of agent j. We model behavior as a function of beliefs:

$$x_j = \arg\max_{x \in \mathcal{X}} u_j(x, \pi_j)$$

The behavioral consequences of doxonomic production are diverse:

- **Voting**: belief in meritocracy reduces support for redistributive policy.
- **Consumption**: belief in consumer identity drives purchasing decisions.
- **Cooperation**: belief in selfish human nature reduces cooperative behavior in public goods settings (Fischbacher et al. 2001).
- **Labor compliance**: belief in the moral value of work increases tolerance for poor working conditions.
- **Tolerance of inequality**: belief that wealth reflects merit reduces demand for redistribution (Piketty 2014).
- **Resistance**: belief that "there is no alternative" reduces engagement with counter-narratives.

Definition 5.14 (Self-Fulfilling Belief)**.** A belief p is *self-fulfilling* if the behavioral consequences of holding p generate evidence that appears to confirm p. Formally, p is self-fulfilling if the mapping $\pi \mapsto \text{evidence}(\mathcal{B}(\pi))$ is such that $\text{evidence}(\mathcal{B}(\pi))$ is more consistent with p when $\pi(p)$ is high.

Self-fulfilling beliefs are the most dangerous doxonomic products because they generate their own evidence. The belief that "people are selfish" leads to institutions designed around selfishness (incentive contracts, competitive structures, monitoring systems), which elicit selfish behavior, which appears to confirm the belief. Breaking a self-fulfilling cycle requires intervening at the *institutional design* level, not just at the narrative level.

5.7 Stage 6: Reproduction

The final stage closes the loop. Behavioral patterns generate institutional demands, electoral outcomes, market structures, and philanthropic priorities that feed back into the funding vector.

Definition 5.15 (Doxonomic Equilibrium)**.** A *doxonomic equilibrium* is a fixed point of the belief production chain:

$$\boldsymbol{F}^* = \mathcal{B}(\boldsymbol{F}^*)$$

At equilibrium, the beliefs produced by the system generate exactly the behaviors and institutions that sustain those beliefs.

Theorem 5.16 (Existence of Equilibrium)**.** *If each operator in the chain is continuous and the composed map $\mathcal{B} : K \to K$ for a compact convex set $K \subset \mathbb{R}^m_{\geq 0}$, then at least one doxonomic equilibrium exists.*

Proof. By Brouwer's fixed-point theorem, every continuous map from a compact convex set to itself has a fixed point. The continuity assumption requires that small changes in funding produce small changes in narrative output, exposure, belief, behavior, and reproduction, reasonable for aggregate quantities, though potentially violated at phase transitions. The compactness assumption requires bounded funding ($K \subset [0, F_{\max}]^m$), which is physically realistic. □

Conjecture 5.17 (Multiplicity of Equilibria)**.** *For most doxonomic systems with nonlinear internalization (thresholds, social proof, self-fulfilling dynamics), multiple equilibria exist. A society may be locked into a "selfish human nature" equilibrium or a "cooperative human nature" equilibrium, each self-sustaining. Transitions between equilibria require coordinated disruption of the belief production chain at multiple stages simultaneously.*

Remark 5.18 (Equilibrium Selection). When multiple equilibria exist, the question becomes: which one does a society end up in? This is the *equilibrium selection problem*. History, path dependence, and the timing of doxonomic investments determine selection. A society that happened to receive large early investments in selfish-anthropology institutions (e.g., through the Mont Pèlerin network in the 1950s–1970s) may be locked into that equilibrium, even if a cooperative equilibrium would be stable too, had the initial investment gone the other way. This is the doxonomic version of "history matters."

5.8 Generational Reproduction as a Fixed-Point Problem

The most powerful form of reproduction is generational. Each generation's beliefs are partly determined by the institutional environment they grow up in, which was built by the previous generation's beliefs.

Model 5.19 (Generational Fixed Point)**.** Let $\boldsymbol{B}_t$ be the belief distribution of generation t and $\mathcal{I}_t$ the institutional ecology inherited from the previous generation. The dynamics are:

$$\mathcal{I}_{t+1} = h(\boldsymbol{B}_t, \mathcal{I}_t) \quad \text{(institutions reflect current beliefs + inertia)} \tag{5.3}$$

$$\boldsymbol{B}_{t+1} = \Psi(\Phi(\mathcal{I}_{t+1}), \boldsymbol{B}_0^{(t+1)}) \quad \text{(new generation's beliefs shaped by inherited institutions)} \tag{5.4}$$

where $\boldsymbol{B}_0^{(t+1)}$ is the prior distribution of the incoming generation (partly shaped by family, partly by innate tendencies). A *generational equilibrium* satisfies $\boldsymbol{B}^* = \Psi(\Phi(h(\boldsymbol{B}^*, \mathcal{I}^*)), \boldsymbol{B}_0)$: the beliefs that institutions transmit to the new generation are the same beliefs that sustain those institutions.

Generational reproduction is why doxonomic equilibria can persist for centuries. The belief that "monarchy is divinely ordained" persisted for a thousand years not because each generation was independently persuaded but because each generation grew up in institutions (churches, courts, feudal structures) built on that assumption. When the institutional environment changed (print revolution, rising merchant class, Enlightenment universities), the generational fixed point shifted.

5.9 Comparison with Input-Output Models

The belief production chain bears structural resemblance to Leontief input-output models in economics. In Leontief's framework, each sector's output is an input to other sectors, and equilibrium is a fixed point of the production matrix.

Model 5.20 (Doxonomic Input-Output)**.** Let $\boldsymbol{A}$ be a matrix where A_{ij} represents the fraction of channel j's output that serves as input to channel i. For example, $A_{21} = 0.3$ means 30% of think tank output ($j = 1$) is picked up by media ($i = 2$) as source material. The total narrative output vector $\boldsymbol{n}$ satisfies

$$\boldsymbol{n} = \boldsymbol{A}\boldsymbol{n} + \boldsymbol{d}$$

where $\boldsymbol{d}$ is exogenous demand (direct funder injection). The solution, when $(\boldsymbol{I} - \boldsymbol{A})$ is invertible, is

$$\boldsymbol{n} = (\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{d}$$

The matrix $(\boldsymbol{I}-\boldsymbol{A})^{-1}$ is the *doxonomic multiplier*: it shows how a unit injection of narrative through one channel amplifies through the system.

Example 5.21 (Multiplier Interpretation)*.* Consider a three-channel system: think tanks ($k = 1$), media ($k = 2$), education ($k = 3$). Suppose

$$\boldsymbol{A} = \begin{pmatrix} 0 & 0.1 & 0 \\ 0.4 & 0 & 0.1 \\ 0.2 & 0.3 & 0 \end{pmatrix}$$

This means: 40% of think-tank output is picked up by media; 20% eventually enters education; 30% of media output enters education; and so on. The Leontief inverse $(\boldsymbol{I} - \boldsymbol{A})^{-1}$ reveals that a \$1 injection into think tanks produces more than \$1 of total narrative output, because the think-tank output amplifies through media and education. The $(3, 1)$ entry of the inverse gives the *total* effect on education of a unit injection into think tanks, including all indirect pathways.

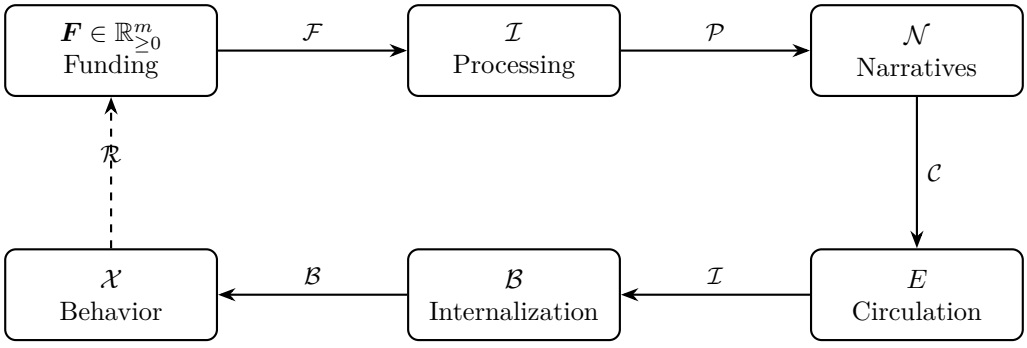
5.10 Where Chains Break: Failure Modes

Not every doxonomic investment succeeds. The chain can break at any stage:

1. **Funding failure**: insufficient resources, donor fatigue, or political change cuts funding.
2. **Processing failure**: the institution produces low-quality output, is caught fabricating evidence, or faces internal rebellion (researchers refuse to produce the desired conclusion).
3. **Circulation failure**: the narrative fails to reach the target audience (gatekeepers block it, algorithms deprioritize it, counter-narratives dominate attention).
4. **Internalization failure**: the audience rejects the narrative (identity resistance, lived experience contradicts the claim, counter-inoculation is effective).
5. **Behavioral failure**: the belief is internalized but does not produce the expected behavior (people believe meritocracy but vote for redistribution anyway, because material self-interest overrides).
6. **Reproduction failure**: behavioral changes do not feed back into funding (the beneficiaries of the belief do not reinvest in its production).

Principle 5.22 (Weakest Link)**.** The effectiveness of a belief production chain is determined by its weakest stage. A brilliantly funded and processed narrative that cannot circulate (Stage 3 failure) is as ineffective as a well-circulated narrative that the audience rejects (Stage 4 failure). Counter-doxonomic strategy (Chapter 32) should target the weakest link of the dominant chain.

5.11 The Full Chain Diagram



5.12 Notes and References

The operator-composition framework is original to this text. The Leontief input-output analogy draws on standard economic input-output analysis; for the

original framework, see Leontief (1941). Self-fulfilling beliefs in cooperation are documented in Fischbacher et al. (2001) and Henrich et al. (2001). Threshold models of collective behavior originate with Granovetter (1978) and Schelling (1978). Cascade models appear in Banerjee (1992) and Bikhchandani et al. (1992). The concept of doxonomic equilibrium as a fixed point connects to North (1990) on institutional equilibria. Brouwer's fixed-point theorem is standard; for social science applications, see Jackson (2008).

On motivated reasoning and identity-protective cognition, see Kahan et al. (2012) and Mercier and Sperber (2017). The illusory truth effect is reviewed in Kahneman (2011). Social proof as a persuasion mechanism is analyzed in Cialdini (2006). The Reinhart-Rogoff episode is documented in Herndon, Ash, and Pollin (2014). On dark money and funding opacity, see Mayer (2016). Generational reproduction of belief through institutional transmission draws on Bourdieu (1984) and Bowles and Gintis (1976). On performativity (models that reshape the reality they describe), see MacKenzie (2006).

Equilibrium selection in games with multiple equilibria is a deep problem in economic theory; see Schelling (1978) for focal-point selection and North (1990) for path-dependent institutional selection.

5.13 Exercises

Exercise 5.1. Compute the doxonomic multiplier $(\boldsymbol{I} - \boldsymbol{A})^{-1}$ for the three-channel system in Example 5.21. Interpret the $(2,1)$ and $(3,1)$ entries: how much total media output and education output results from a unit injection into think tanks?

Exercise 5.2. Verify the conditions of Theorem 5.16 for a specific two-channel system. Define explicit operators $\mathcal{F}$, $\mathcal{P}$, $\mathcal{C}$, $\mathcal{I}$, $\mathcal{B}$, $\mathcal{R}$ with concrete functional forms, verify continuity and compactness, and conclude that an equilibrium exists.

Exercise 5.3. Consider two competing belief production chains (one promoting "human nature is selfish," the other promoting "human nature is cooperative") sharing the same population. Model this as a two-player game over funding allocations and characterize the Nash equilibrium. Under what conditions does the better-funded chain always win? Under what conditions can the less-funded chain prevail?

Exercise 5.4. For the augmented internalization model (5.2), show that if $\alpha_{\text{social}} > \alpha_{\text{Bayes}}$, a doxonomic system can maintain high B_i even when new evidence against p_i is available, provided the perceived social norm $\hat{\mu}_j$ remains high. Interpret: when does social proof override evidence?

Exercise 5.5. Design a disruption strategy that breaks a self-reinforcing doxonomic equilibrium. At which stage of the chain is intervention most cost-

effective? Argue formally using the weakest-link principle and the relative costs of intervening at each stage.

Exercise 5.6. The text defines self-fulfilling beliefs (Definition 5.14). Give three examples of beliefs that are self-fulfilling and three that are self-undermining (holding them generates evidence against them). What determines which type a belief is?

Exercise 5.7. Using Model 5.19, consider a society where the current generation believes strongly in meritocracy ($\boldsymbol{B}_t = 0.8$). They build institutions (schools, labor markets) around this belief. Under what conditions does the next generation inherit the same belief level? Under what conditions does generational reproduction fail (the next generation's beliefs diverge from the previous generation's)?

Exercise 5.8. Identify a historical case where a belief production chain broke at each of the six failure modes listed in Section 5.10. For each case, explain what caused the failure and what happened to the belief afterward.

You now have the foundational vocabulary: doxa*, the belief production chain, epistemic capital, narrative infrastructure, and the doxonomic system as a formal object. You can identify the core units of analysis (funding, institutions, narratives, exposure, belief) and trace them through a production chain. Part II develops these concepts into formal models.*

Part II

Concepts and Models

CHAPTER 6

Epistemic Capital

> Every established order tends to produce the naturalization of its own arbitrariness.
>
> Pierre Bourdieu, *Outline of a Theory of Practice*

Not all dollars are equal in the market for belief. A dollar spent through a prestigious university carries more doxonomic force than a dollar spent on a billboard. The difference is *epistemic capital*: the accumulated stock of credibility, authority, and attention that an institution or agent can deploy in the production of belief.

Epistemic capital is the currency of the doxonomic system. It determines the conversion rate at which economic resources become belief effects. A think tank with high epistemic capital can shift policy debates with a single report; one with low epistemic capital can produce a hundred reports that no one reads. Understanding how epistemic capital is accumulated, converted, deployed, destroyed, and distributed is central to doxonomic analysis.

6.1 Definition and Structure

Definition 6.1 (Epistemic Capital)**.** The *epistemic capital* of an agent or institution a is a vector

$$\mathcal{E}(a) = (\mathcal{E}_{\text{cred}}(a),\ \mathcal{E}_{\text{att}}(a),\ \mathcal{E}_{\text{auth}}(a)) \in \mathbb{R}^3_{\geq 0}$$

where:

- $\mathcal{E}_{\text{cred}}$ is *credibility capital*: the degree to which a's outputs are treated as reliable by audiences. Sources: track record of accuracy, institutional prestige, peer endorsement, professional credentials.

- $\mathcal{E}_{\text{att}}$ is *attention capital*: the audience share a commands, how many people will encounter a's outputs. Sources: subscriber base, media citations, social media following, search ranking.
- $\mathcal{E}_{\text{auth}}$ is *authority capital*: the degree to which a can set the terms of legitimate discourse, defining what questions are askable, what methods are acceptable, what conclusions are serious. Sources: institutional gatekeeping positions, editorial control, curriculum authority, regulatory standing.

This extends Bourdieu's analysis of capital forms (Bourdieu 1984; Bourdieu 1991). Where Bourdieu distinguished economic, cultural, social, and symbolic capital qualitatively, we provide a quantitative decomposition oriented specifically toward belief production.

The three components are partially independent. An institution can have high credibility but low attention (an obscure but respected research lab), high attention but low credibility (a viral social media account), or high authority but low attention (a regulatory body whose rulings shape an industry but whose reports are unread by the public). The doxonomic force of an institution depends on the *product* of relevant components, not on any single one.

Definition 6.2 (Doxonomic Force)**.** The *doxonomic force* of an institution a with respect to belief i is

$$\Phi_i(a) = \mathcal{E}_{\text{cred}}(a) \cdot \mathcal{E}_{\text{att}}(a) \cdot R_{a,i}$$

where $R_{a,i}$ is the relevance of a's domain to belief i. Authority capital enters indirectly: $\mathcal{E}_{\text{auth}}$ shapes the boundaries of $\mathcal{N}$ (which narratives are "in play") rather than the force of any particular narrative.

Example 6.3 (Epistemic Capital Profiles). Consider five institutions and their approximate capital vectors (illustrative scores on a 0–1 scale, not empirically calibrated):

Institution	$\mathcal{E}_{\text{cred}}$	$\mathcal{E}_{\text{att}}$	$\mathcal{E}_{\text{auth}}$
Harvard Economics Dept.	0.92	0.15	0.85
New York Times	0.70	0.60	0.55
Heritage Foundation	0.55	0.35	0.50
Joe Rogan podcast	0.20	0.80	0.05
Anonymous Twitter account	0.05	0.40	0.01

Harvard has high credibility and authority but limited direct public reach. The *Times* has a balanced profile. Heritage has moderate credibility but strong policy-world authority. Joe Rogan has enormous attention capital but low credibility among experts and near-zero authority capital. An anonymous

Twitter account can command surprising attention but has negligible credibility or authority.

The doxonomic strategy of channeling narratives through complementary institutions exploits the comparative advantage of each: Heritage (credibility + authority), the *Times* (attention + credibility), social media (attention).

6.2 Conversion Functions

Epistemic capital is not created from nothing. It is converted from other forms of capital, primarily economic capital, through specific institutional mechanisms. The conversion is neither instant nor guaranteed: building credibility takes years, building authority takes decades, and both can be destroyed in days.

Definition 6.4 (Capital Conversion)**.** A *capital conversion function* is a map $\phi : \mathbb{R}_{\geq 0} \to \mathbb{R}^3_{\geq 0}$ such that

$$\mathcal{E}(a, t+1) = \mathcal{E}(a, t) + \phi(f_a(t)) - \delta \cdot \mathcal{E}(a, t)$$

where $f_a(t)$ is the economic investment at time t and $\delta \in (0, 1)$ is a depreciation rate. The function ϕ is typically concave: the marginal epistemic capital gained per dollar decreases with scale.

The concavity of ϕ is important. It means that the first million dollars invested in building a new think tank buys more credibility than the hundredth million. At some point, additional spending on institutional trappings (nicer offices, more conferences, shinier publications) produces negligible additional credibility. This is the doxonomic analogue of diminishing returns.

Example 6.5 (Conversion Pathways)*.* Different investments convert economic capital into different components of $\mathcal{E}$:

Investment	**Mechanism**	$\Delta\mathcal{E}_{\text{cred}}$	$\Delta\mathcal{E}_{\text{att}}$	$\Delta\mathcal{E}_{\text{auth}}$
Endow a university chair ($5M)	Institutional affiliation, peer network	High	Low	Medium
Fund a think tank ($5M/yr)	Reports, op-eds, testimony	Medium	Medium	Medium
Buy advertising ($5M)	Audience reach, repetition	Low	High	None
Fund a journal ($2M/yr)	Gatekeeping, peer review	Medium	Low	High
Sponsor a conference ($500K)	Network effects, prestige association	Medium	Low	Medium
Hire a PR firm ($1M)	Media placement, message optimization	Low	Medium	None

The most cost-effective credibility conversion is institutional affiliation: attaching a narrative to a university, a professional body, or a credentialed expert. The most cost-effective attention conversion is advertising or viral

content. Authority capital is the hardest to purchase directly; it accumulates through sustained institutional presence over time.

Proposition 6.6 (Steady-State Epistemic Capital)**.** *Under constant investment f and depreciation rate δ, the epistemic capital converges to a steady state:*

$$\mathcal{E}^* = \frac{\phi(f)}{\delta}$$

Institutions that stop investing ($f = 0$) decay exponentially: $\mathcal{E}(t) = \mathcal{E}(0) \cdot e^{-\delta t}$ with half-life $t_{1/2} = \ln 2/\delta$. For institutions with $\delta \approx 0.02$ (elite universities, legacy media), $t_{1/2} \approx 35$ years. For institutions with $\delta \approx 0.2$ (social media influencers, digital outlets), $t_{1/2} \approx 3.5$ years.

Remark 6.7 (The Time Asymmetry of Credibility). Credibility is slow to build and fast to destroy. The accumulation timescale is $\tau_{\text{build}} \sim 1/\phi'(f)$, which for credibility capital is typically years to decades. The destruction timescale can be instantaneous: a single scandal, a single fabrication, a single revealed conflict of interest can reduce $\mathcal{E}_{\text{cred}}$ by a large fraction overnight. This asymmetry has a doxonomic consequence: institutions with high credibility capital have a strong incentive to maintain quality, not out of virtue, but because their most valuable asset is fragile. When this incentive is undermined (e.g., by pressure from funders who value message over accuracy), the institution's credibility begins to erode.

6.3 Epistemic Rents

Definition 6.8 (Epistemic Rent)**.** An *epistemic rent* is the excess doxonomic return earned by an agent due to a monopoly or near-monopoly position in the production of legitimate knowledge on a topic. Formally, if the competitive doxonomic return per dollar is r^*, an agent with epistemic rent earns $r > r^*$ due to barriers to entry in the credibility market. The rent is $\rho = r - r^*$.

Epistemic rents explain why certain institutions (elite universities, credentialed professions, legacy media) exert disproportionate influence on public belief relative to their expenditure. They have accumulated credibility that new entrants cannot quickly replicate.

Example 6.9 (Sources of Epistemic Rent).

- **Credential barriers**: only holders of an MD can authoritatively pronounce on medical treatment; only holders of a PhD in economics are taken seriously in policy debates. The credential system creates a barrier to entry that protects incumbents' epistemic rent.
- **Brand accumulation**: the *New York Times* has accumulated credibility over 170 years. A new publication cannot replicate this overnight, regardless of quality. The brand acts as a moat around the epistemic rent.

- **Network effects**: a journal's authority depends on who publishes in it, and who publishes in it depends on its authority. This circularity creates a self-reinforcing advantage for established journals.
- **Institutional interlocking**: elite institutions cite each other, hire each other's graduates, and appear on each other's boards. This network structure distributes epistemic rent across the cluster while making it difficult for outsiders to penetrate.

Proposition 6.10 (Rent Persistence)**.** *If the depreciation rate δ is low and barriers to credibility accumulation are high, epistemic rents can persist for decades. Formally, the half-life of an epistemic rent is $t_{1/2} = \ln 2/\delta$, which for institutions with $\delta \approx 0.02$ gives $t_{1/2} \approx 35$ years. Rent persistence means that the current credibility landscape is substantially determined by investments made a generation ago.*

6.4 Credibility Destruction

If epistemic capital is the most valuable asset in doxonomic production, then credibility destruction is the most potent weapon in doxonomic warfare.

Definition 6.11 (Credibility Attack)**.** A *credibility attack* on institution a is an action that reduces $\mathcal{E}_{\text{cred}}(a)$. Types include:

1. **Exposure**: revealing hidden funding, conflicts of interest, or fabrication.
2. **Delegitimation**: framing the institution as biased, politicized, or captured ("liberal academia," "mainstream media").
3. **Flooding**: producing so much contradictory content that the audience cannot distinguish credible from non-credible sources ("epistemic pollution").
4. **Co-optation**: infiltrating the institution to degrade its output quality from within.

Example 6.12 (The War on Expertise). The systematic delegitimation of scientific expertise on climate change is a case of organized credibility attack (Oreskes and Conway 2010). The fossil fuel industry did not need to build higher credibility than climate scientists. It needed only to *reduce* the credibility of climate science enough that the public perceived a "debate," a strategy of epistemic pollution rather than epistemic competition. The cost of reducing public trust in climate science was far lower than the cost of building a credible alternative scientific consensus. This asymmetry (destruction is cheaper than construction) is a fundamental property of epistemic capital.

Proposition 6.13 (Destruction-Construction Asymmetry)**.** *Let $c_{build}(\Delta\mathcal{E})$ be the cost of increasing an institution's credibility by $\Delta\mathcal{E}$ and $c_{destroy}(\Delta\mathcal{E})$ the cost of reducing a rival's credibility by the same amount. Generically, $c_{destroy} \ll c_{build}$. One scandal can destroy what took decades to build. This*

asymmetry implies that doxonomic systems with high epistemic capital are structurally vulnerable to well-funded credibility attacks.

6.5 Interaction Effects Between Capital Types

The three components of epistemic capital do not operate independently. They interact in ways that create both synergies and vulnerabilities.

Model 6.14 (Capital Interaction Matrix)**.** The evolution of epistemic capital is governed by:

$$\frac{d}{dt}\mathcal{E}(a) = \phi(f_a) - \delta \cdot \mathcal{E}(a) + \boldsymbol{M} \cdot \mathcal{E}(a)$$

where $\boldsymbol{M}$ is a 3×3 interaction matrix. Key interactions:

- $M_{\text{att,cred}} > 0$: credibility attracts attention (credible sources get cited, shared, invited).
- $M_{\text{auth,cred}} > 0$: credibility enables authority (credible institutions are invited to set standards, write curricula, advise governments).
- $M_{\text{cred,att}} < 0$ (potentially): excessive attention can reduce credibility ("selling out," "dumbing down," "clickbait").
- $M_{\text{att,auth}} > 0$: authority generates attention (authoritative pronouncements are newsworthy).

The negative interaction $M_{\text{cred,att}} < 0$ is doxonomically significant. It means there is a tension between reaching a mass audience and maintaining credibility among discriminating audiences. Institutions that "go viral" sometimes find their credibility among experts diminished. This is the *populism-credibility tradeoff*: you can speak to everyone or be believed by the serious people, but doing both is difficult.

Example 6.15 (The Academic-Public Dilemma). An economist who writes a popular book (high $\Delta\mathcal{E}_{\text{att}}$) may find their standing among peers reduced (negative $\Delta\mathcal{E}_{\text{cred}}$ in academic circles). An academic department that aggressively markets itself on social media may be perceived by peer departments as unserious. This creates an institutional incentive against public engagement. From a doxonomic perspective, the highest-credibility institutions systematically underinvest in public communication, leaving the public information environment to lower-credibility sources.

6.6 Epistemic Capital Inequality

Epistemic capital, like economic capital, is unequally distributed. A small number of institutions control a disproportionate share of credibility, attention, and authority.

Definition 6.16 (Epistemic Gini Coefficient)**.** The *epistemic Gini coefficient* for a population of n institutions with doxonomic forces $\Phi_1, \ldots, \Phi_n$ is

$$G_{\mathcal{E}} = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} |\Phi_i - \Phi_j|}{2n \sum_{i=1}^{n} \Phi_i}$$

$G_{\mathcal{E}} = 0$ indicates perfect equality; $G_{\mathcal{E}} = 1$ indicates total concentration.

Remark 6.17. In most media systems, the epistemic Gini is very high, likely exceeding the economic Gini. A handful of outlets (major newspapers, broadcast networks, dominant platforms) command the majority of public attention, while thousands of smaller outlets share the remainder. The implication: the effective "electorate" of the belief-production system is far more concentrated than the political electorate. This concentration is the structural basis of doxonomic power (Chapter 9).

6.7 The Digital Disruption of Epistemic Capital

The internet disrupted traditional epistemic capital hierarchies in several ways:

- **Attention democratization**: anyone can publish, reducing the barriers to $\mathcal{E}_{\text{att}}$. Blogs, podcasts, YouTube channels, and social media accounts compete with legacy media for audience.
- **Credibility unbundling**: traditional media bundled attention and credibility together (the *Times* had both). Digital media unbundled them: a viral tweet has enormous attention but no institutional credibility.
- **Authority erosion**: gatekeeping functions (editorial selection, peer review, professional licensing) are partially circumvented by direct-to-audience publishing.
- **Speed advantage**: digital channels can produce and circulate narrative faster than traditional institutions, meaning low-credibility sources often set the initial frame that high-credibility sources then react to.

Model 6.18 (Two-Tier Epistemic Capital)**.** In the digital era, epistemic capital bifurcates:

- **Institutional capital** ($\mathcal{E}^I$): slow to build, high credibility, high authority, moderate attention. Still dominates policy, academia, and elite discourse.
- **Network capital** ($\mathcal{E}^N$): fast to build, low credibility, low authority, potentially very high attention. Dominates popular discourse, social media, and cultural conversation.

The doxonomic competition between institutional and network capital is one of the defining features of the contemporary information environment. Legacy institutions have $\mathcal{E}^I \gg \mathcal{E}^N$; digital-native actors have $\mathcal{E}^N \gg \mathcal{E}^I$. Neither can easily convert their capital into the other type.

This bifurcation creates a distinctive doxonomic dynamic. Policy elites and academic experts retain institutional capital and shape law and regulation.

Digital influencers and populist media retain network capital and shape public mood and electoral outcomes. The two systems operate semi-independently, producing the conditions for epistemic fragmentation (Chapter 12).

6.8 The Credibility Market

We can model the production of credibility as a market in which institutions compete for audience trust.

Model 6.19 (Credibility Market)**.** Let n institutions compete by choosing quality q_k (costly) and signaling s_k (also costly). The audience assigns credibility $C_k = h(q_k, s_k, \mathcal{E}_{\text{cred}}(k))$ where h is increasing in all arguments. Equilibrium credibility levels satisfy

$$\max_{q_k, s_k} C_k \cdot P_k \cdot \pi_k - c_q(q_k) - c_s(s_k)$$

where π_k is the revenue from doxonomic output and c_q, c_s are cost functions for quality and signaling respectively.

This model reveals a market failure: because credibility has a public-good character (audiences benefit from accurate information regardless of whether they pay for it), the market tends to under-produce genuine quality and over-produce cheap signals.

Proposition 6.20 (The Lemons Problem in Credibility)**.** *If audiences cannot perfectly distinguish quality from signaling (h depends on s_k as well as q_k), then in equilibrium, some institutions will substitute signaling for quality. As audiences learn that signals are noisy, they discount all sources, including high-quality ones. This is the* epistemic lemons problem*: low-quality producers drive down the perceived value of the entire market, just as bad used cars drive good ones off the lot (Akerlof and Shiller 2015). The result is a race to the bottom in credibility, especially in domains where quality is hard to assess (complex policy, long-run predictions, statistical claims).*

6.9 Notes and References

The concept of epistemic capital formalizes ideas in Bourdieu (1984) and Bourdieu (1991). The three-component decomposition (credibility, attention, authority) extends Bourdieu's capital typology to the specific needs of doxonomic analysis. The economics of credibility connects to Stigler (1961) on the economics of information and Akerlof and Shiller (2015) on manipulation and deception. Epistemic rents parallel the rent concept in Stiglitz (2012). The market for ideas is analyzed in Coase (1974). For the role of expertise as a form of capital, see Eyal (2019).

On the destruction of credibility through organized doubt, see Oreskes and Conway (2010). The digital disruption of epistemic hierarchies is analyzed in Benkler et al. (2018) and Zuboff (2019). On the tension between popular communication and expert credibility, see Eyal (2019). The epistemic lemons problem extends Akerlof's (1970) market-for-lemons argument to the information domain. On epistemic injustice as a structural barrier to credibility accumulation, see Fricker (2007): members of marginalized groups face systematic credibility deficits regardless of the quality of their testimony, which is a form of epistemic capital inequality not reducible to institutional investment.

For the interaction between different forms of capital, see Bourdieu's general theory of capital conversion in Bourdieu (1984). The concept of network capital as distinct from institutional capital draws on Benkler (2006) and the literature on networked public spheres.

6.10 Exercises

Exercise 6.1. Estimate the epistemic capital vector $\mathcal{E}$ for three institutions of your choice (e.g., a national newspaper, a social media influencer, a university department). Justify your estimates. Compute the doxonomic force $\Phi_i(a)$ for each with respect to a specific belief.

Exercise 6.2. Prove that if ϕ is strictly concave, there exists an optimal investment level f^* beyond which additional spending on credibility conversion has diminishing returns below the depreciation rate. Formally: find f^* such that $\phi'(f^*) = \delta$. What happens if the institution invests $f > f^*$?

Exercise 6.3. Model a "credibility laundering" operation in which a low-credibility funder channels money through a high-credibility institution. What is the net credibility gain? Under what conditions does the institution's credibility itself depreciate from the association? Use the capital conversion dynamics to model the institution's credibility trajectory when it accepts tainted funding.

Exercise 6.4. Compute the epistemic Gini coefficient for a hypothetical media system with five outlets having doxonomic forces $\Phi = (100, 50, 20, 5, 1)$. Is this system more or less concentrated than a typical economic wealth distribution? What would a policy intervention to reduce $G_{\mathcal{E}}$ look like?

Exercise 6.5. Analyze the credibility attack strategy used against climate science. Which of the four attack types (exposure, delegitimation, flooding, co-optation) were employed? Estimate the cost of the attack relative to the cost of building the scientific credibility it targeted.

Exercise 6.6. For the two-tier model (Model 6.18), consider an institution that tries to build both $\mathcal{E}^I$ and $\mathcal{E}^N$ simultaneously. Under what conditions is this possible without the populism-credibility tradeoff destroying institutional capital? Give a real-world example of an institution that has succeeded (or failed) at this.

Exercise 6.7. Write out the full 3×3 interaction matrix $\boldsymbol{M}$ for a university, a think tank, and a social media influencer. For each, which off-diagonal entries are positive, negative, or zero? How do the interaction effects shape the long-run evolution of each institution's epistemic capital?

CHAPTER 7

Narrative Infrastructure

> Who controls the past controls the future. Who controls the present controls the past.
>
> George Orwell, *Nineteen Eighty-Four*

Beliefs do not float freely. They travel through infrastructure: schools, media organizations, platforms, think tanks, entertainment industries, professional training systems, and religious institutions. Just as an economy requires physical infrastructure (roads, ports, power grids) to move goods, a doxonomic system requires *narrative infrastructure* to move beliefs from production to population.

This chapter models narrative infrastructure as a directed network of transformation functions with measurable capacity, throughput, concentration, and vulnerability. The infrastructure is not neutral: its topology determines which narratives can travel far and which are stillborn.

7.1 Infrastructure as Transformation Network

Definition 7.1 (Narrative Infrastructure)**.** A *narrative infrastructure* $\mathcal{N}$ is a directed weighted graph $G = (V, E, w)$ where:

- each vertex $v \in V$ is an institution with processing function $\iota_v : \mathbb{R}_{\geq 0} \times \mathcal{N} \to \mathcal{N}$,
- each directed edge $(u, v) \in E$ carries a flow weight $w_{uv} \in [0, 1]$ representing the fraction of u's output that serves as input to v,
- the network has source nodes (funders injecting resources) and sink nodes (audience segments absorbing narratives).

The key insight is that narrative infrastructure is not a flat landscape. It has topology: some paths are wide and well-maintained (the pipeline from elite

think tanks through prestige media to policy debate), while others are narrow or blocked (the path from grassroots organizations to national attention). The infrastructure determines *which* narratives are structurally advantaged, independent of their truth or popularity.

Example 7.2 (The Conservative Narrative Pipeline). The American conservative movement built one of the most effective narrative pipelines in modern history, documented in Mayer (2016) and Mirowski and Plehwe (2009):

$$\text{Donors} \xrightarrow{0.8} \text{Foundations} \xrightarrow{0.9} \text{Think tanks} \xrightarrow{0.5} \text{Op-ed pages} \xrightarrow{0.6} \text{Cable news} \xrightarrow{0.7} \text{Public}$$

The flow weights indicate the estimated fraction of output that propagates to the next stage. The end-to-end propagation probability is $\prod_i w_i = 0.8 \times 0.9 \times 0.5 \times 0.6 \times 0.7 \approx 0.15$, seemingly low, but applied to hundreds of reports per year across dozens of institutions, it produces a constant stream of narrative output reaching the public through high-credibility channels.

A parallel pipeline runs through academia:

$$\text{Donors} \xrightarrow{0.7} \text{Endowed programs} \xrightarrow{0.6} \text{Textbooks} \xrightarrow{0.8} \text{Curricula} \xrightarrow{0.95} \text{Students}$$

This pipeline has lower throughput per year but vastly higher persistence ($T \sim$ decades).

Remark 7.3 (Infrastructure vs. Content). A crucial distinction: narrative infrastructure is about the *channels*, not the *messages*. The same infrastructure that carries "markets are efficient" could, in principle, carry "markets are prone to failure." But infrastructure is not neutral: institutions built to produce one type of narrative develop staff, expertise, donor relationships, and organizational culture that make producing alternative narratives costly. A think tank funded for 30 years to argue against regulation does not easily pivot to arguing for it. Infrastructure has inertia.

7.2 Institutional Types and Their Infrastructure Roles

Different institutions occupy structurally different positions in the narrative infrastructure. Their roles can be classified by where they sit in the production chain and what transformation they perform.

Definition 7.4 (Infrastructure Role Taxonomy)**. Generators** produce original narrative content: research universities, think tanks, investigative journalists, research labs.

Amplifiers increase the reach of existing narratives without substantially transforming them: broadcast media, social media platforms, wire services, syndication networks.

Translators transform narratives from one register to another: textbook authors (research → pedagogy), popularizers (academic → public), lobbyists (policy research → legislative language).

Validators attach credibility to narratives: peer review systems, professional associations, credentialing bodies, editorial boards.

Gatekeepers control access to high-value channels: editors, algorithm designers, curriculum committees, conference organizers.

A single institution may perform multiple roles. The *New York Times* is simultaneously a generator (original reporting), an amplifier (wire service redistribution), a translator (making complex events accessible), a validator (the prestige of publication implies quality), and a gatekeeper (deciding what is "fit to print"). This multi-role character gives major media institutions outsized structural power.

Education	**Generator + Translator + Validator.** High persistence (∼decades), high credibility, low throughput per unit time. Shapes foundational priors. Most consequential long-run infrastructure.
Prestige Media	**Generator + Amplifier + Gatekeeper.** Medium persistence (∼months), high credibility, medium throughput. Sets the daily agenda and frames for elites and opinion leaders.
Social Media	**Amplifier + (sometimes) Generator.** Very low persistence (∼hours), low credibility, very high throughput. Amplifies, fragments, and accelerates. Algorithms act as invisible gatekeepers.
Think Tanks	**Generator + Validator.** High credibility in policy circles, low direct public reach. Produces the "studies show" citations that legitimate policy narratives.
Entertainment	**Translator + Amplifier.** High reach, low perceived persuasive intent. Normalizes through narrative representation, not argument. Operates at layers 3–5.
Religious Institutions	**Generator + Validator + Community.** Very high persistence, high credibility within congregations, medium reach. Unique access to moral framing and identity formation.
Professional Training	**Translator + Validator.** Converts academic knowledge into operational assumptions. MBA programs, law schools, medical training embed anthropological regimes into professional practice.

7.3 Throughput and Capacity

Definition 7.5 (Narrative Throughput)**.** The *throughput* of an institution v is the quantity

$$\Theta(v) = F_v \cdot P_v \cdot T_v$$

measuring the total belief-exposure-hours produced per unit time. The *capacity* $\Theta^{\max}(v)$ is the maximum throughput achievable given institutional constraints (staffing, infrastructure, brand).

Throughput combines three dimensions: how much is spent, how many people are reached, and how long the effect lasts. This composite measure allows comparison across radically different channel types.

Example 7.6 (Throughput Comparison). Consider three channels, each receiving \$1M/year:

Channel	P	T (years)	Θ (M\$ · person · yr)
University economics course	0.001	30	0.03
Cable news segment	0.05	0.02	0.001
Textbook chapter	0.005	20	0.1

The textbook has 100 times the throughput of cable news, despite reaching far fewer people per day, because its persistence is three orders of magnitude higher. This is why doxonomic strategists who understand the mathematics invest in education and publishing, not just media.

Remark 7.7 (Why Throughput Is Not Impact). Throughput measures exposure, not belief change. A high-throughput channel with low credibility (social media) may produce less actual belief change than a low-throughput channel with high credibility (a mentor's advice). The full impact depends on the internalization operator $\mathcal{I}$ (Chapter 5), which weights exposure by credibility, resistance, and audience characteristics. Throughput is a necessary but not sufficient condition for doxonomic effect.

7.4 Network Topology and Structural Advantage

The topology of narrative infrastructure creates structural advantages and disadvantages for different narratives.

Definition 7.8 (Narrative Pathway)**.** A *narrative pathway* from source s to audience segment t is a directed path $s = v_0, v_1, \ldots, v_l = t$ in the infrastructure graph G. The *pathway efficiency* is

$$\eta(s \to t) = \prod_{i=0}^{l-1} w_{v_i, v_{i+1}} \cdot C_{v_i}$$

measuring the fraction of the original narrative that reaches the audience, weighted by the credibility accumulated along the way.

Proposition 7.9 (Structural Advantage)**.** *A narrative n_1 has a* structural advantage *over narrative n_2 if the maximum pathway efficiency from any source to the target audience is higher for n_1:*

$$\max_s \eta_{n_1}(s \to t) > \max_s \eta_{n_2}(s \to t)$$

Structural advantage arises from the infrastructure, not from the content. A narrative with better-connected institutional sponsors, more pathways to high-credibility amplifiers, and shorter routes to the target audience has a structural advantage regardless of its truth value.

Example 7.10 (Structural Advantage: Deregulation vs. Public Ownership). The narrative "deregulation promotes efficiency" has extensive infrastructure: well-funded think tanks (Heritage, Cato, AEI) connected to prestigious op-ed pages (*WSJ*, *FT*), cable news panels, congressional testimony channels, and economics curricula. The maximum pathway efficiency to U.S. policymakers is high.

The narrative "public ownership can be efficient" has minimal infrastructure: a few academic advocates, limited think-tank support, almost no connections to major op-ed pages or cable news. The maximum pathway efficiency to the same policymakers is low.

This structural difference exists *independently* of the empirical merits of either claim. It is a property of the infrastructure, not of the evidence.

7.5 Concentration Metrics

Definition 7.11 (Epistemic Herfindahl Index)**.** The *epistemic Herfindahl index* for narrative infrastructure is

$$\text{EHI} = \sum_{v \in V} \left(\frac{\Theta(v)}{\sum_{u \in V} \Theta(u)} \right)^2$$

Values near 1 indicate monopoly in narrative production; values near $1/|V|$ indicate deconcentration.

Conjecture 7.12 (Concentration and Capture)**.** *If* $\text{EHI} > \bar{h}$ *for a critical threshold $\bar{h}$, then a single institution or small coalition has the* capacity *to achieve common-sense capture (Definition 2.5) on propositions within its narrative domain, provided sufficient funding and absent strong counter-institutions, resistant audiences, or contradicting lived experience. The threshold $\bar{h}$ is not a universal constant; it depends on audience receptivity, competing credibility structures, and proposition-content fit.*

Example 7.13 (Concentration in U.S. Media). As of 2020, five companies (Comcast/NBCUniversal, Disney, ViacomCBS, WarnerMedia, News Corp/Fox)

controlled approximately 90% of U.S. media consumption (Bagdikian 2004). If we weight by throughput (reach × persistence), the EHI for U.S. national media is approximately 0.20–0.25, near the threshold typically associated with high concentration in market economics.

But this understates doxonomic concentration, because the five companies share substantial overlap in:

- advertising dependence (same advertisers, same incentive structure),
- sourcing patterns (same wire services, same government press conferences),
- professional culture (journalism schools produce a shared worldview),
- ownership class interests (all publicly traded, all dependent on deregulatory environment).

Effective doxonomic concentration is higher than EHI alone suggests, because the "competing" outlets share structural filters (Chapter 3, Section 3.10).

Definition 7.14 (Effective Concentration)**.** The *effective concentration* adjusts EHI for narrative correlation:

$$\mathrm{EHI}_{\mathrm{eff}} = \mathrm{EHI} + (1 - \mathrm{EHI}) \cdot \bar{\rho}$$

where $\bar{\rho} \in [0, 1]$ is the average pairwise narrative correlation between outlets (measured by text similarity, framing overlap, or source sharing). When all outlets produce identical narratives ($\bar{\rho} = 1$), $\mathrm{EHI}_{\mathrm{eff}} = 1$ regardless of market structure: a perfectly correlated oligopoly is doxonomically equivalent to a monopoly.

7.6 Infrastructure Resilience and Vulnerability

Definition 7.15 (Infrastructure Vulnerability)**.** A narrative infrastructure is *vulnerable* at node v if removing v significantly reduces the maximum pathway efficiency for a class of narratives. The *vulnerability index* of v is

$$\nu(v) = 1 - \frac{\max_s \eta_{-v}(s \to t)}{\max_s \eta(s \to t)}$$

where η_{-v} is the pathway efficiency with v removed. High $\nu(v)$ means v is a critical bottleneck.

Example 7.16 (Bottleneck Institutions). In many countries, a small number of editorial gatekeepers control access to the prestige media pipeline. If three editors at major newspapers decide that a topic is not newsworthy, the pathway from think-tank research to public attention is effectively blocked. These editors have high vulnerability indices: removing them from the network (or changing their editorial stance) would significantly alter which narratives reach the public.

Similarly, a curriculum committee that approves textbooks for a state with millions of students is a high-vulnerability node. Texas's State Board of Education, which approves textbooks used by 5.5 million students, has historically been a bottleneck node with outsized doxonomic influence on national textbook content (publishers produce one version for Texas and sell it nationally).

Proposition 7.17 (Infrastructure Fragility Under Concentration)**.** *Highly concentrated infrastructure (*EHI *high) is more efficient for narrative transmission but more fragile: disruption of a single high-throughput node has a larger system-wide effect. Formally, if* $\Theta(v)/\sum_u \Theta(u) > 1/2$ *for some* v*, then* $\nu(v) > 1/2$ *and the infrastructure is critically dependent on* v*.*

This creates a design tension: concentrated infrastructure is powerful but fragile; distributed infrastructure is resilient but less efficient. Chapter 33 considers what institutional design best balances efficiency and resilience.

7.7 Infrastructure Construction and Path Dependence

Narrative infrastructure does not appear overnight. Building it requires sustained investment over years or decades.

Example 7.18 (Building Conservative Infrastructure)*.* The conservative narrative infrastructure in the United States was consciously constructed over 40 years (Mayer 2016; Phillips-Fein 2009):

- **1947**: Mont Pèlerin Society founded (intellectual seed).
- **1971**: Lewis Powell memo urges American business to invest in ideological infrastructure.
- **1973**: Heritage Foundation founded ($250K initial; $80M+ budget by 2020).
- **1977**: Cato Institute founded.
- **1980s**: Olin, Scaife, and Bradley foundations dramatically increase grants to conservative law-and-economics programs at universities.
- **1990s**: Fox News launched (1996), completing the broadcast amplification layer.
- **2000s**: Digital expansion (Daily Wire, Turning Point USA, PragerU).

Total estimated investment: several billion dollars over four decades. The result: a vertically integrated pipeline from academic seed-planting through policy production, media amplification, and political mobilization.

No comparable left-of-center infrastructure was built during the same period (Mudge 2018). This infrastructure asymmetry, not a difference in the quality of ideas, explains much of the rightward shift in American policy common sense between 1980 and 2020.

Principle 7.19 (Infrastructure Path Dependence)**.** Once built, narrative infrastructure is self-reinforcing: institutions produce alumni who staff other institutions, generate citations that boost credibility, create demand for their own output, and develop donor relationships that ensure continued funding. Replicating an established infrastructure from scratch requires investment of comparable scale, which is why infrastructure asymmetries persist across decades.

7.8 Platform Infrastructure: The Algorithmic Layer

Digital platforms add a new layer to narrative infrastructure: the algorithmic layer, which sits between institutional production and audience reception.

Model 7.20 (Algorithmic Infrastructure)**.** A platform algorithm is a function $A : \mathcal{N} \times \mathcal{U} \to [0, 1]$ mapping each narrative-user pair (n, j) to a display probability $A(n, j)$. The algorithm determines the effective exposure matrix:

$$e_{jk}^{\text{eff}} = e_{jk} \cdot A(n_k, j)$$

The platform's objective function (typically engagement maximization) determines A endogenously:

$$A^* = \arg\max_{A} \sum_{j,k} A(n_k, j) \cdot \text{engagement}(n_k, j)$$

Because high-engagement content tends toward moral outrage, identity threat, and simplistic narratives, engagement maximization systematically distorts the effective narrative infrastructure (Zuboff 2019).

Remark 7.21 (Platforms as Invisible Gatekeepers). Traditional gatekeepers (editors, curriculum committees) are visible and accountable. Algorithmic gatekeepers are invisible and optimized for a private objective (engagement/revenue). This means the most consequential infrastructure decisions (which narratives reach which audiences) are made by systems that are neither transparent nor democratically accountable. From a doxonomic perspective, platform algorithms may be the single most powerful gatekeeper institution in the contemporary information environment, yet they are the least understood and least regulated.

7.9 Notes and References

Media concentration is studied in Bagdikian (2004) and McChesney (1999). Comparative media systems analysis is developed in Hallin and Mancini (2004). The role of think tanks in narrative production is documented in Mayer (2016),

Mirowski and Plehwe (2009), and Phillips-Fein (2009). Platform infrastructure is analyzed in Zuboff (2019) and Benkler et al. (2018). The network model of media draws on Jackson (2008). The Herfindahl index originates in Herfindahl (1950). For public-interest alternatives, see Benkler (2006). On the propaganda model's structural filters as infrastructure properties, see Herman and Chomsky (1988). The concept of narrative correlation adjusting effective concentration is new to this text but draws on the literature on media parallelism in Hallin and Mancini (2004). On the construction of conservative intellectual infrastructure, see Mayer (2016) and Phillips-Fein (2009); on the absence of a comparable left infrastructure, see Mudge (2018).

7.10 Exercises

Exercise 7.1. Compute EHI for U.S. national television news using publicly available audience share data. Then estimate the average narrative correlation $\bar{\rho}$ (using a qualitative assessment of framing similarity) and compute EHI_{eff}. How much does the correction change the concentration assessment?

Exercise 7.2. Model the narrative pipeline from the Atlas Network to public opinion on regulation in a specific country. Draw the infrastructure graph, estimate the flow weights w_{uv} at each stage, and compute the end-to-end pathway efficiency. Where is the pipeline most likely to fail?

Exercise 7.3. Prove that $\text{EHI} \geq 1/|V|$ with equality if and only if all institutions have equal throughput.

Exercise 7.4. A new social media platform enters the narrative infrastructure with $P = 0.4$, $C = 0.15$, $T = 0.05$. How does this change the overall EHI? Does it increase or decrease the conditions for common-sense capture? (Consider both the direct effect on concentration and the indirect effect on narrative correlation.)

Exercise 7.5. Identify the three highest-vulnerability nodes in the narrative infrastructure of your country (using the vulnerability index $\nu(v)$). For each, describe what would happen if that node were captured by a single funder or if it ceased to function.

Exercise 7.6. Compare the conservative narrative pipeline (Example 7.18) with the infrastructure available to labor movements or environmental movements. Draw both pipeline graphs. Where are the structural asymmetries? What would it cost to close the infrastructure gap?

Exercise 7.7. Model a platform algorithm that maximizes engagement. Show that if outrage-inducing content generates higher engagement, the algorithm will systematically amplify narratives with high emotional valence and low nuance. What does this imply for the narrative entropy H (Definition 17.14) of the platform's output?

Exercise 7.8. The throughput comparison (Example 7.6) suggests that textbooks are 100 times more cost-effective than cable news. Why, then, do doxonomic funders invest heavily in cable news? Give at least three reasons why the throughput calculation does not capture the full strategic picture.

CHAPTER 8

Common-Sense Capture

> The smart way to keep people passive and obedient is to strictly limit the spectrum of acceptable opinion, but allow very lively debate within that spectrum.
>
> Noam Chomsky

The most powerful doxonomic achievement is not persuading people to hold a belief. It is making a belief so pervasive that it ceases to be recognized as a belief at all. A funded narrative becomes invisible infrastructure, indistinguishable from the texture of reality.

This chapter formalizes *common-sense capture*: the phase transition by which a contested proposition becomes unquestioned background, the mechanisms that produce it, the conditions that sustain it, and the signatures by which it can be detected.

8.1 Capture as Phase Transition

Definition 8.1 (Common-Sense Capture)**.** A belief p is *captured* in a population if:

1. $\mu(p) > \theta$ for a high threshold θ (widespread adoption),
2. $\mathrm{Var}(\pi_j(p)) < \varepsilon$ for small ε (tight concentration),
3. the proposition p is not salient as a *claim*. It is experienced as a feature of reality.

Conditions (1) and (2) are measurable. Condition (3) is the distinctively doxonomic condition: p has exited the space of contestation.

The transition from "widely held opinion" to "common sense" is not gradual. It exhibits threshold behavior analogous to phase transitions in physics. Below

the critical threshold, a belief is debated, contested, and recognized as a position. Above it, the belief disappears into the background: it is no longer argued for because it no longer needs to be.

Example 8.2 (Stages of Capture). Consider the proposition "economic growth is the primary objective of government policy."

1. **Contested (pre-1950s)**: alternative objectives were actively debated, including full employment, social solidarity, moral improvement, imperial expansion, and class harmony.
2. **Dominant (1950s–1970s)**: GDP growth became the primary metric, but alternatives (quality of life, distributional equity) were still voiced in mainstream discourse.
3. **Common sense (1980s–2000s)**: growth became so dominant that questioning it sounded eccentric. Policy debates assumed growth as the goal and argued only about means.
4. **Captured/doxic (2000s–present)**: growth is not argued for; it is the unstated premise of virtually all policy discussion. A politician who says "we should not pursue growth" is not engaging in a legitimate policy debate; they are committing a category error.

The transition from stage 2 to stage 4 is what doxonomics calls capture.

8.2 Threshold Models

Following Granovetter (1978) and Schelling (1978), we model adoption as a threshold process. The core insight is that individual adoption decisions depend on how many others have already adopted: people are more willing to hold a belief when they perceive it as socially supported.

Model 8.3 (Granovetter-Schelling Belief Adoption)**.** Each agent j has a threshold $\tau_j \in [0, 1]$ drawn from a distribution $G(\tau)$. Agent j adopts belief p if and only if the fraction of the population already holding p exceeds τ_j:

$$\pi_j(p) = 1 \iff \mu(p) \geq \tau_j$$

The equilibrium population fraction is a fixed point of

$$\mu^* = G(\mu^*)$$

The threshold τ_j can be interpreted as agent j's "social proof requirement": how many people must hold a belief before j is willing to adopt it. Agents with low thresholds are *early adopters* (they adopt without much social support); agents with high thresholds are *holdouts* (they adopt only when almost everyone else already has).

Theorem 8.4 (Tipping Point)**.** *If G is continuous and $G(0) > 0$ (some agents adopt unconditionally), then there exists at least one stable equilibrium*

μ^*. *A doxonomic investment that shifts G downward (lowering thresholds by increasing social pressure, institutional endorsement, or reducing the perceived cost of adoption) can cause a discontinuous jump in μ^*, a* tipping point.

Proof sketch. The function $h(\mu) = G(\mu) - \mu$ is continuous with $h(0) = G(0) > 0$ and $h(1) = G(1) - 1 \leq 0$. By the intermediate value theorem, h has a zero. Stability requires $G'(\mu^*) < 1$. A downward shift in G (uniform reduction in thresholds) raises $G(\mu)$ for all μ, which can push μ^* past a saddle-node bifurcation, causing the low-adoption equilibrium to disappear and the system to jump to the high-adoption equilibrium. □

Example 8.5 (Tipping in Belief Adoption). Consider a population with threshold distribution $G(\tau) = \tau^{1/2}$ (many agents have low thresholds; few are extreme holdouts). The fixed points satisfy $\mu = \mu^{1/2}$, giving $\mu^* = 0$ and $\mu^* = 1$. The interior dynamics are: for any $\mu > 0$, we have $G(\mu) = \mu^{1/2} > \mu$, so adoption grows. This system has only one stable equilibrium: $\mu^* = 1$ (complete adoption). Any nonzero seed of adoption cascades to unanimity.

Now consider $G(\tau) = \tau^2$ (most agents have high thresholds). The fixed points satisfy $\mu = \mu^2$, giving $\mu^* = 0$ and $\mu^* = 1$. For $\mu \in (0, 1)$, $G(\mu) = \mu^2 < \mu$, so adoption shrinks. This system has only one stable equilibrium: $\mu^* = 0$ (no adoption). Even substantial initial adoption erodes to zero.

The doxonomic implication: the *shape* of the threshold distribution (determined by institutional environment, prior narrative exposure, and social structure) determines whether a belief can cascade. Doxonomic investment works by reshaping G: lowering thresholds through institutional endorsement, repetition, and social proof until the system tips.

Remark 8.6 (What Determines Thresholds?). Individual thresholds τ_j are not fixed parameters. They depend on:

- **Institutional endorsement**: when authoritative institutions adopt p, individual thresholds drop ("if Harvard says so, it must be reasonable").
- **Perceived cost of dissent**: in environments where questioning p is socially costly (mockery, professional risk, ostracism), thresholds drop (people adopt to avoid punishment, not because they are convinced).
- **Narrative coherence**: when p fits into an existing ideological bundle (Definition 2.3), thresholds drop because adoption is cognitively cheap.
- **Prior exposure**: repeated exposure to p through multiple channels lowers thresholds via the illusory truth effect.
- **Identity alignment**: when p is framed as aligned with a valued identity, thresholds drop; when framed as threatening, thresholds rise.

Doxonomic investment works on thresholds through all five mechanisms simultaneously.

8.3 The Doxonomic Investment Needed for Capture

How much does capture cost? This depends on the initial threshold distribution, the available channels, and the target belief.

Model 8.7 (Capture Cost)**.** Let $G_0(\tau)$ be the initial threshold distribution and $G_F(\tau)$ the distribution after doxonomic investment F. Assume investment uniformly lowers thresholds: $G_F(\tau) = G_0(\tau - \alpha F)$ for some effectiveness parameter α. The minimum investment F^* needed for capture is the smallest F such that the high-adoption fixed point of $\mu = G_F(\mu)$ exists and is globally stable.

At the tipping point, G_F must be tangent to the 45-degree line from below:

$$G_F(\mu^*) = \mu^* \quad \text{and} \quad G_F'(\mu^*) = 1$$

These two equations determine (μ^*, F^*).

Remark 8.8. The capture cost F^* depends critically on the initial threshold distribution. In populations with many low-threshold agents (already predisposed by prior narrative exposure or identity alignment), F^* is small: a nudge suffices. In populations with many high-threshold agents (resistant due to counter-institutions, lived experience, or strong alternative narratives), F^* can be enormous. This explains why the same doxonomic operation can succeed in one context and fail in another: the target population's threshold distribution matters as much as the budget.

8.4 Mechanisms of Capture

Capture does not happen through a single mechanism. It typically involves the coordinated operation of several:

8.4.1 Institutional Saturation

When enough institutions treat p as an operational premise, the cumulative effect is overwhelming. A student who encounters p in economics class, in management training, in the workplace, in advertising, in entertainment, and in political discourse receives p from so many independent-seeming sources that it appears to be a natural fact rather than a specific claim.

Definition 8.9 (Institutional Saturation)**.** A belief p is *institutionally saturated* if the fraction of institutional contexts in which p functions as an operational premise exceeds a threshold σ:

$$\frac{|\{U_i \in \mathcal{U} : p \in \sigma_i\}|}{|\mathcal{U}|} > \sigma$$

where $\mathcal{U}$ is the cover of social life by institutional contexts and σ_i is the local belief system of context U_i (Chapter 12).

Institutional saturation is related to but distinct from population-level adoption. A belief can be institutionally saturated (p is embedded in workplaces, schools, and media) without being unanimously held (many individuals privately doubt p). This is the pluralistic-ignorance configuration (Definition 2.8): the institutional environment enforces p as operational reality even where private belief is weak.

8.4.2 Crowding Out Alternatives

Capture involves not just amplifying p but *suppressing alternatives*. When the narrative infrastructure is saturated with p, there is no institutional space for $\neg p$: no funding, no platforms, no expert endorsement, no curriculum presence. The alternatives do not need to be explicitly censored; they are simply not produced at sufficient volume to be encountered.

Definition 8.10 (Narrative Crowding Out)**.** A belief p *crowds out* alternative q if the doxonomic investment in p reduces the effective throughput for q:

$$\frac{\partial \Theta(q)}{\partial F(p)} < 0$$

This occurs when p and q compete for the same infrastructure (media attention, curriculum space, expert endorsement, public attention) and p's dominance leaves insufficient residual capacity for q.

8.4.3 Normalization Through Repetition

Sheer repetition makes a claim feel true (the illusory truth effect). When p is encountered daily across multiple channels, it acquires the phenomenological quality of familiarity, which the cognitive system interprets as evidence for truth. This is not a rational process; it is a cognitive heuristic that doxonomic systems exploit.

8.4.4 Social Proof Cascades

Once a critical mass of people (or, more importantly, a critical mass of *visible* people) endorses p, social proof dynamics take over. Each new adopter makes p appear more normal, which lowers the threshold for the next adopter, which makes p appear even more normal, a positive feedback cascade that accelerates toward capture.

Model 8.11 (Social Proof Cascade)**.** Let $\mu(t)$ be the fraction holding p at time t, with dynamics:

$$\frac{d\mu}{dt} = \alpha\phi(t)(1-\mu) + \beta\mu(1-\mu) - \delta\mu$$

where $\alpha\phi(t)$ is institutional production, β is the social proof coefficient, and δ is natural decay. Setting $d\mu/dt = 0$, the non-trivial equilibria satisfy:

$$\mu^* = \frac{(\alpha\phi + \beta - \delta) \pm \sqrt{(\alpha\phi + \beta - \delta)^2 + 4\beta\alpha\phi}}{2\beta}$$

When β is large (strong social proof), the system is bistable: there is a low-μ equilibrium and a high-μ equilibrium, separated by an unstable threshold. Doxonomic investment (increasing ϕ) pushes the system across the threshold and into the high-μ basin.

8.5 Path Dependence and Lock-In

Once a belief crosses the tipping point, it becomes self-reinforcing through the feedback mechanisms described in Chapter 5: the belief generates behaviors that generate institutions that generate funding that generates more of the same belief.

Definition 8.12 (Doxonomic Lock-In)**.** A belief p is *locked in* if the doxonomic equilibrium $\mu^*(p)$ is locally asymptotically stable and the basin of attraction is large, meaning that small perturbations (counter-narratives, contrary evidence, temporary funding cuts) do not dislodge it.

Proposition 8.13 (Lock-In Condition)**.** *Lock-in occurs when the self-reinforcement gain exceeds the natural decay rate:*

$$\left.\frac{\partial \mu^{(t+1)}}{\partial \mu^{(t)}}\right|_{\mu=\mu^*} > 1 - \delta$$

where δ is the rate at which belief decays absent reinforcement.

Lock-in has a temporal dimension. The longer a belief has been locked in, the harder it is to dislodge, because:

- institutional infrastructure has been built around it (path dependence),
- professional careers depend on it (vested interests),
- curricula have transmitted it to new generations (generational reproduction),
- alternative beliefs have atrophied for lack of institutional support (crowding out),
- the belief has shaped behavior in ways that generate confirming evidence (self-fulfillment).

Example 8.14 (Lock-In: Homo Economicus). The selfish-rational-agent model (homo economicus) has been locked in as the operational anthropology of economic policy since approximately the 1980s. Dislodging it would require simultaneous intervention at multiple points:

- **Curricula**: rewriting economics textbooks to foreground conditional cooperation, behavioral complexity, and institutional context.
- **Professional norms**: changing what counts as "rigorous" economic analysis in journals, tenure review, and policy consulting.
- **Policy design**: replacing incentive-based regulation with trust-based institutional design.
- **Management theory**: replacing principal-agent models with cooperative organizational theories.
- **Popular culture**: producing narratives in which cooperative behavior is normal, not exceptional.

No single intervention suffices because the lock-in operates at all five levels simultaneously. This is why lock-in is so durable: disrupting one level is compensated by the other four.

8.6 Saturation and Diminishing Returns

Proposition 8.15 (Diminishing Returns Post-Capture)**.** *Once common-sense capture is achieved ($\mu(p) > \theta$), the marginal belief change per additional dollar of funding approaches zero:*

$$\lim_{\mu \to 1} \frac{\partial \mu}{\partial F} = 0$$

Post-capture, doxonomic spending shifts from persuasion to maintenance*: preventing erosion rather than producing new converts.*

This has several practical implications:

1. **Maintenance is cheaper than capture.** The cost of maintaining a captured belief is typically an order of magnitude lower than the cost of capturing it. Once the infrastructure is built, the institutions staffed, and the curricula written, the system runs on inertia plus modest annual investment. This asymmetry explains why dominant narratives persist long after the original funding rationale has changed.
2. **Over-investment is common.** Funders often continue spending at capture-level rates even after capture has been achieved, because they cannot easily measure the current belief level and err on the side of caution. This produces *doxonomic waste*: resources spent reinforcing beliefs that are already unquestioned.
3. **The marginal dollar is better spent on new frontiers.** Once p is captured, a rational doxonomic investor should redirect resources to adjacent beliefs $(p_2, p_3, \ldots)$ that extend the ideological bundle, rather

than pouring more money into p itself. This is the doxonomic analogue of market saturation in product economics.

8.7 Detecting Capture: Empirical Signatures

How does a researcher identify that a belief has been captured rather than merely being popular? The detection methods from Section 2.7 apply, but we can add quantitative signatures:

Definition 8.16 (Capture Signature)**.** A belief p shows a *capture signature* if:

1. **Asymmetric argumentation**: p appears overwhelmingly as a premise rather than a conclusion in public discourse (measurable via corpus analysis).
2. **Low narrative entropy**: the narrative space around p's domain has collapsed to a small number of frames ($H(t)$ below baseline; see Definition 17.14).
3. **High institutional saturation**: p functions as an operational assumption in a large fraction of institutional contexts (Definition 8.9).
4. **Anomaly response**: challenges to p are met with confusion or ridicule rather than counter-argument.
5. **Funding-belief decoupling**: p's prevalence persists even during periods of reduced doxonomic investment (the belief runs on institutional inertia, not active funding).
6. **Cross-domain consistency**: p appears in economics, management, law, media, and everyday speech without any domain citing the others as its source.

Remark 8.17. Not all captured beliefs are false, and not all uncaptured beliefs are true. The capture signature identifies a *structural* property of the belief's social position, not an epistemic property of its content. "The earth orbits the sun" is also captured (near-universal, low variance, invisible as a claim), but it is captured *because it is true and well-evidenced*, not because of doxonomic investment. The researcher must distinguish evidence-driven capture from investment-driven capture, which requires the separation of audit and evaluation (Principle 2.16).

8.8 Historical Case: The Capture of "Markets Know Best"

The belief that markets are generally superior to government in allocating resources provides a detailed case study of the capture process.

Phase 1: Contestation (1930s–1960s). In the aftermath of the Great Depression, market-skeptical views dominated: Keynesian macroeconomics,

strong regulation, public ownership of utilities, and active industrial policy were mainstream. The belief "markets know best" was a minority position, associated with a small network of Austrian and Chicago economists.

Phase 2: Infrastructure Building (1947–1980). The Mont Pèlerin Society (1947), the Foundation for Economic Education, and later the Heritage Foundation (1973), Cato Institute (1977), and dozens of smaller think tanks built the narrative infrastructure. Funding from Olin, Scaife, Koch, and Bradley foundations supported law-and-economics programs at universities, endowed chairs, and produced a generation of economists, lawyers, and policy intellectuals committed to market-first thinking (Mirowski and Plehwe 2009; Slobodian 2018).

Phase 3: Political Capture (1979–1990). Thatcher and Reagan brought the narrative to political power. Deregulation, privatization, and tax cuts were enacted. The behavioral consequences (rising stock markets, new consumer products, visible wealth creation for some) appeared to confirm the narrative.

Phase 4: Common-Sense Capture (1990s–2008). By the 1990s, even center-left parties (Clinton's Democrats, Blair's New Labour) adopted market-first assumptions. The "Washington Consensus" made market liberalization the default prescription for developing countries. Alternatives (industrial policy, public ownership, cooperative models) were no longer debated; they were simply absent from serious policy discussion.

Phase 5: Partial Fracture (2008–present). The financial crisis disrupted the capture by generating a massive contradiction (markets spectacularly failed to self-correct). But the fracture was partial: despite the crisis, the policy response (austerity, quantitative easing for banks, limited re-regulation) largely preserved market-first assumptions. The belief was shaken but not dislodged: evidence of deep lock-in.

Remark 8.18. This case illustrates the full capture trajectory: from minority position to infrastructure building to political implementation to common-sense invisibility to partial fracture under contradiction. The total doxonomic investment over 60 years was plausibly in the billions of dollars. The capture was not permanent (the 2008 crisis opened cracks), but the lock-in was strong enough to survive even a dramatic empirical refutation.

8.9 Escape from Capture

If common-sense capture is so durable, how does it ever end? Chapter 31 treats this in detail, but a preview is useful here.

Conjecture 8.19 (Conditions for De-Capture)**.** *A captured belief p can be dislodged when:*

1. ***Contradiction accumulates**: the gap between p and lived experience becomes too large for institutional maintenance to bridge (e.g., "markets self-correct" during a prolonged recession).*
2. ***Counter-infrastructure exists**: alternative institutions have been built that can supply a replacement narrative at sufficient volume (e.g., the environmental movement built enough infrastructure to challenge growth-as-progress).*
3. ***Generational turnover**: new cohorts arrive without the formative exposure that locked in p for the previous generation.*
4. ***Elite defection**: high-credibility insiders publicly break with p, reducing the social cost of dissent (e.g., prominent economists questioning homo economicus after 2008).*
5. ***Crisis opens the Overton window**: an exogenous shock temporarily suspends the normal inertia of common sense (Chapter 30).*

Typically, multiple conditions must coincide. Single-condition de-capture is rare; this is why lock-in is so durable.

8.10 Notes and References

Threshold models originate with Granovetter (1978) and Schelling (1978). Cascade and herding models appear in Banerjee (1992) and Bikhchandani et al. (1992). Path dependence in institutional contexts is treated in North (1990). The concept of lock-in from technology economics (Arthur 1989) transfers to the belief domain. On the invisibility of dominant frames, see Lukes (2005).

The capture of market-first ideology is documented in Mirowski and Plehwe (2009), Harvey (2005), Slobodian (2018), and Phillips-Fein (2009). On the illusory truth effect and repetition-based persuasion, see Kahneman (2011). Social proof dynamics are analyzed in Cialdini (2006). On the partial fracture of market fundamentalism after 2008, see Streeck (2016). For the concept of crowding out in media and attention markets, see McChesney (1999). On narrative entropy as a measure of discursive openness, see the information-theoretic framework in Chapter 17. The concept of institutional saturation extends the Althusserian notion of ideological state apparatuses (Althusser 1971) into a measurable condition.

8.11 Exercises

Exercise 8.1. Given a threshold distribution $G(\tau) = \tau^2$ on $[0, 1]$, find all fixed points of $\mu^* = G(\mu^*)$. Determine their stability. What is the minimum uniform threshold reduction Δ needed to create a stable high-adoption equilibrium? Plot $G(\tau)$ and the shifted $G(\tau - \Delta)$ to illustrate.

Exercise 8.2. For the social proof cascade model (Model 8.11) with $\alpha = 0.3$, $\beta = 0.5$, $\delta = 0.1$, find the minimum institutional investment ϕ^* needed for a

stable high-adoption equilibrium to exist. Plot the phase portrait for ϕ just below and just above ϕ^*.

Exercise 8.3. Estimate the maintenance cost of the belief "economic growth is always desirable" by identifying three institutions that continuously reinforce it and estimating their annual budgets. Compare the maintenance cost to a rough estimate of the original capture cost (infrastructure built from the 1940s onward).

Exercise 8.4. Design a formal test to distinguish a belief that is common sense (Definition 2.5) from one that is captured (Definition 8.1). What empirical evidence would differentiate the two? Apply your test to "democracy is the best form of government."

Exercise 8.5. Model the crowding-out effect formally. Let two beliefs p and q compete for a shared narrative infrastructure with total capacity $\Theta_{\max}$. Show that if $\Theta(p) + \Theta(q) \leq \Theta_{\max}$, increased investment in p necessarily reduces throughput for q. Under what conditions can q survive despite being outspent?

Exercise 8.6. Apply the capture signature (Definition 8.16) to the belief "a university degree is necessary for a good career." Assess each of the six criteria. Is this belief captured? If so, who benefits from its capture?

Exercise 8.7. Choose a belief that has been partially de-captured in the past 20 years (e.g., "smoking is glamorous," "homosexuality is a disorder," "colonialism was civilizing"). Trace the de-capture process through the five conditions in Conjecture 8.19. Which conditions were most important? Was the de-capture complete or partial?

Exercise 8.8. The chapter claims that "maintenance is cheaper than capture." Formalize this claim using the social proof cascade model. Show that the per-period funding needed to maintain μ^* near 1 is lower than the total funding needed to reach μ^* from $\mu = 0$. Under what conditions is this *not* true?

CHAPTER 9

Doxonomic Power

> The most effective way to destroy people is to deny and obliterate their own understanding of their history.
>
> George Orwell

Power in doxonomics is not the capacity to coerce but the capacity to set the conditions under which people form their beliefs. A state that rules by force is fragile; a state whose citizens genuinely believe that the existing order is natural, just, or inevitable barely needs force at all. Doxonomic power is this second kind: the power to shape what appears thinkable, reasonable, and real.

This chapter formalizes doxonomic power in four dimensions, shows how distributed systems produce coordinated ideological effects without central planning, analyzes prior-setting as the deepest form of doxonomic power, and connects the framework to epistemic injustice and the structural production of ignorance.

9.1 Four Dimensions of Power

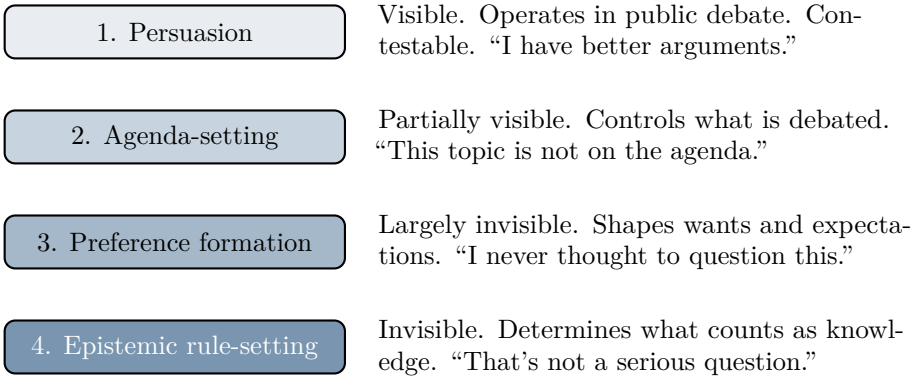
Lukes (2005) distinguished three faces of power. We extend his framework to four dimensions, each operating at a deeper level than the last.

Definition 9.1 (Dimensions of Doxonomic Power)**.**

1. **First dimension** (persuasion): the capacity to win arguments in public debate, to prevail within existing frames using evidence, rhetoric, or authority.
2. **Second dimension** (agenda-setting): the capacity to control which arguments *reach* public debate, deciding what is discussed and what is excluded, which questions are asked and which are not.

3. **Third dimension** (preference formation): the capacity to shape what people want, expect, and consider possible, installing anthropological regimes, forming aspirations, calibrating the sense of what is "realistic."
4. **Fourth dimension** (epistemic rule-setting): the capacity to determine the *rules of the epistemic game*, what counts as evidence, who counts as an expert, which methods are legitimate, which forms of knowledge are "serious."

Each dimension operates at a deeper level and is harder to detect:



Example 9.2 (Four Dimensions in Climate Policy). **First dimension:** The fossil fuel industry funds scientists and commentators who argue against climate action in public debates, op-eds, and congressional hearings.

Second dimension: Lobbying ensures that carbon taxation and fossil fuel subsidy reform are not placed on the legislative agenda; media gatekeepers frame climate as "both sides" issue rather than scientific consensus.

Third dimension: Decades of consumer-culture narratives have installed the expectation that cheap energy and unlimited mobility are normal, making any policy that raises energy costs feel like deprivation rather than correction.

Fourth dimension: The definition of "sound economics" has been shaped to require cost-benefit analyses that discount future damages heavily, treat GDP growth as the primary welfare metric, and classify ecological limits as "externalities," framing assumptions that structurally disadvantage climate action regardless of the evidence.

The first dimension is visible and contestable. The fourth dimension is invisible: it determines the framework within which all subsequent debates occur.

Proposition 9.3 (Power Ordering)**.** *The dimensions form a hierarchy of cost-effectiveness. Fourth-dimensional power is the most cost-effective because*

it shapes all subsequent belief formation:

$$\text{IROI}_4 > \text{IROI}_3 > \text{IROI}_2 > \text{IROI}_1$$

where IROI_d *is the ideological return on investment at dimension d.*

Remark 9.4 (Why the Ordering Holds). First-dimensional power (persuasion) must be exercised argument by argument, proposition by proposition. Second-dimensional power (agenda-setting) controls which propositions enter the debate, multiplying the effect across all excluded topics. Third-dimensional power (preference formation) shapes the priors from which all arguments are evaluated, tilting every debate simultaneously. Fourth-dimensional power (epistemic rule-setting) determines which *types of evidence* are admissible, affecting not just one domain but the entire epistemic landscape. A dollar invested in changing the definition of "rigorous evidence" shapes every future debate; a dollar invested in winning a single argument shapes only that one.

Example 9.5 (Fourth-Dimensional Power: Economics as Epistemic Rule-Setting). The discipline of economics exercises fourth-dimensional doxonomic power not primarily through its specific conclusions but through its *methods and definitions*:

- defining welfare as preference satisfaction (rather than capabilities, flourishing, or equality),
- requiring cost-benefit analysis as the standard of policy evaluation (rather than rights-based, precautionary, or democratic deliberation),
- treating GDP as the default measure of social performance (rather than inequality, sustainability, health, or social cohesion),
- assuming rational self-interest as the behavioral baseline (rather than conditional cooperation, reciprocity, or social identity),
- classifying non-market values as "externalities" (linguistically framing them as outside the core of economic reality).

Each of these is a *rule*, not a conclusion. They shape what counts as a legitimate question, what counts as evidence, and what counts as a serious policy proposal. An alternative policy framework that does not express itself in the language of cost-benefit analysis, GDP effects, and incentive-compatible mechanisms is not refuted; it is *not recognized as policy analysis at all* (Mirowski and Plehwe 2009).

9.2 Distributed Coordination Without Conspiracy

A common objection to doxonomic analysis is that it requires conspiracy: a secret group deliberately coordinating belief production. This objection misunderstands the mechanism. Doxonomic coordination typically arises not from conspiracy but from *structural alignment*: independent actors facing similar incentives produce similar outputs, just as firms in a competitive market converge on similar products without colluding.

Principle 9.6 (Structural Alignment)**.** A doxonomic system can produce coordinated ideological output without centralized planning if:

1. funders share material interests (e.g., all major donors benefit from reduced regulation),
2. institutions face similar incentive structures (e.g., dependence on the same funding sources, same advertising markets, same professional norms),
3. professional training aligns outputs (e.g., economics PhD programs produce graduates with a shared worldview who then staff think tanks, media, and government),
4. feedback loops reward convergence (e.g., media outlets that deviate from the consensus lose audience, advertisers, or elite access).

When all four conditions hold, the system produces highly coordinated output from entirely decentralized decision-making.

Herman and Chomsky (1988) demonstrated this with the propaganda model: five structural filters (ownership, advertising, sourcing, flak, and ideology) produce systematic media bias without requiring any explicit coordination. No editor needs to receive instructions from a corporate headquarters. The filters are *structural*: they shape the incentive environment in which editorial decisions are made, and the aggregate result is predictable bias.

Model 9.7 (Emergent Alignment)**.** Let n institutions each independently choose a narrative position $n_k \in \mathcal{N}$ to maximize revenue $r_k(n_k, \boldsymbol{n}_{-k})$ given the positions of others. If revenue functions are correlated (because funders, advertisers, and audiences overlap), the Nash equilibrium $\boldsymbol{n}^*$ will cluster in a narrow region of $\mathcal{N}$, producing apparent coordination from independent profit maximization.

Proposition 9.8 (Narrative Range Under Structural Alignment)**.** *Let the* narrative range $R = \max_{k,l} d(n_k^*, n_l^*)$ *be the diameter of the equilibrium narrative positions. If all institutions share the same primary funder (r_k depends on the same dominant revenue source), then $R \to 0$: all institutions converge on the same narrative. If institutions have diverse, independent funding sources, R can be large: genuine narrative pluralism emerges.*

Proof sketch. Each institution maximizes $r_k(n_k, \boldsymbol{n}_{-k})$. If the dominant revenue source prefers narrative n^*, the first-order condition for each institution yields $n_k^* \approx n^*$ (small deviations are punished by revenue loss). With diverse funding, different institutions face different revenue gradients, pulling them toward different optima. The narrative range R is increasing in the diversity of funding sources. □

Remark 9.9 (The Policy Implication)*.* This result has a direct policy implication: *funding diversity is a structural condition for narrative pluralism.* A media system funded entirely by advertising from the same corporate base will produce

narrow narrative range, regardless of how many outlets exist. A media system with diverse funding (public funding, subscriber revenue, foundation support, advertising from diverse sources) will produce wider narrative range. The number of outlets matters less than the diversity of their revenue structures. This is why media ownership rules and public broadcasting mandates are doxonomically significant.

Example 9.10 (Structural Alignment in Practice). Consider U.S. cable news in the 2000s–2020s. Fox News, CNN, and MSNBC appear to offer diverse perspectives. But all three:

- depend on advertising revenue from the same corporate base,
- are owned by large media conglomerates with interlocking board memberships,
- draw on the same Washington think-tank ecosystem for expert commentary,
- hire from the same journalism school pipeline,
- compete for the same audience demographic using engagement-maximizing formats.

The result: vigorous debate within a narrow narrative range. The channels disagree intensely about whether the tax rate should be 35% or 28%. They do not debate whether the tax system should exist in its current form, whether wage labor is the only viable economic arrangement, or whether GDP growth is the right objective. The spectrum of "acceptable opinion" is lively; the spectrum of *thinkable* opinion is constrained. This is structural alignment in action.

9.3 Power as Prior-Setting

The deepest form of doxonomic power is the ability to set the *prior distribution* from which a population evaluates new information.

Definition 9.11 (Prior-Setting Power)**.** An agent a has *prior-setting power* over a population if a can influence the initial belief distribution $\pi_j^{(0)}$ for agents j, typically through control of educational institutions, childhood media, religious instruction, or early-life cultural narratives.

Prior-setting power is the most durable form of doxonomic power for three reasons:

1. **Bayesian persistence**: agents with different priors interpret the same evidence differently. A person who enters adulthood with the prior "people are fundamentally selfish" will interpret cooperative behavior as strategic and selfish behavior as natural. The same evidence that would persuade a neutral observer is absorbed into the existing framework.
2. **Formative timing**: prior formation occurs during childhood and early education, when critical resistance is lowest, identity is still forming, and

the institutional environment is most controlled (family, school, religious institution).

3. **Compounding over generations**: if generation t's priors shape the institutions that form generation $t+1$'s priors, the effect compounds. A single generation of prior-setting can lock in an anthropological regime for decades (Model 5.19).

Model 9.12 (Prior-Setting Dynamics)**.** Let $\pi_0^{(t)}$ be the average prior of generation t and $\mathcal{I}^{(t)}$ the institutional ecology inherited from the previous generation. The prior-setting dynamics are:

$$\mathcal{I}^{(t)} = h(\pi^{(t-1)}, \mathcal{I}^{(t-1)}) \tag{9.1}$$

$$\pi_0^{(t)} = \gamma \cdot \pi_{\text{family}}^{(t)} + (1-\gamma) \cdot \Phi(\mathcal{I}^{(t)}) \tag{9.2}$$

where $\gamma \in [0,1]$ weights family socialization versus institutional exposure, $\pi_{\text{family}}^{(t)}$ reflects parental transmission (itself a function of the previous generation's posteriors), and $\Phi(\mathcal{I}^{(t)})$ is the prior produced by the educational and media environment.

Proposition 9.13 (Generational Compounding)**.** *If $\gamma < 1$ (institutions have some influence over prior formation) and the institutional update h is self-reinforcing ($\partial h/\partial \pi > 0$), then a one-time doxonomic investment in institutional design can shift priors for multiple generations without further investment. The effective multiplier is $1/(1-\rho)$ where $\rho = (1-\gamma) \cdot \partial\Phi/\partial\mathcal{I} \cdot \partial h/\partial\pi$ is the generational transmission rate.*

Example 9.14 (Prior-Setting: The Cold War and Economics Education)*.* During the Cold War, the U.S. government and allied foundations invested heavily in economics education as a bulwark against socialism (Mirowski and Plehwe 2009). The result: two generations of students whose foundational economic intuitions (markets allocate efficiently, government intervention distorts, self-interest is the reliable behavioral assumption) were formed during formative years. These priors persist in the population long after the Cold War ended, because the institutional infrastructure (economics curricula, textbooks, professional norms) continues to transmit them. This is prior-setting power in action: a generation of investment in educational institutions produced priors that have compounded across three subsequent generations.

9.4 The Production of Ignorance

Doxonomic power operates not only by producing beliefs but by producing *ignorance*: systematically preventing certain questions from being asked, certain evidence from being generated, and certain connections from being made.

Definition 9.15 (Agnotology)**.** *Agnotology* is the study of the deliberate production of ignorance. In doxonomic terms, it is the investment in *not knowing*: funding designed to prevent the generation or circulation of inconvenient knowledge.

Oreskes and Conway (2010) documented the most systematic case: the tobacco and fossil fuel industries' decades-long campaigns to manufacture doubt about the health effects of smoking and the reality of climate change. The strategy was not to produce an alternative scientific consensus (too expensive, too difficult) but to produce *uncertainty*: enough doubt that policymakers could justify inaction.

Model 9.16 (Doubt Production)**.** Let $B_p(t)$ be the public's credence in a scientific consensus p. The doubt-production strategy invests in reducing B_p not by producing evidence for $\neg p$ but by:

1. funding a small number of credentialed contrarians ($\Delta\mathcal{E}^{\neg p}_{\text{cred}}$),
2. demanding impossible standards of proof ("we need more research before acting"),
3. amplifying natural scientific uncertainty beyond its actual magnitude,
4. framing the issue as "both sides" in media coverage.

The effect on public belief is:

$$B_p(t+1) = B_p(t) - \alpha_{\text{doubt}} \cdot F_{\text{doubt}}(t) \cdot \frac{C_{\text{contrarian}}}{C_{\text{consensus}}}$$

Because $C_{\text{contrarian}} > 0$ (they hold genuine credentials) and F_{doubt} can be substantial, the doubt production function can maintain $B_p < \theta_{\text{action}}$ (the credence threshold for policy action) indefinitely, even when the scientific consensus is overwhelming.

Remark 9.17. The doubt-production strategy is doxonomically efficient because it exploits an asymmetry: science produces conclusions with quantified uncertainty ("95% confidence"), while the public interprets any uncertainty as grounds for doubt. The doxonomic investment needed to *amplify perceived uncertainty* is far smaller than the investment needed to *shift the scientific consensus*. This is the agnotological analogue of the destruction-construction asymmetry (Proposition 6.13).

9.5 Epistemic Injustice as Doxonomic Power

Fricker (2007) identified a form of power closely related to the fourth dimension: *epistemic injustice*, in which certain speakers are systematically denied credibility due to their social identity. In doxonomic terms, epistemic injustice is a mechanism by which the credibility weights C_k are allocated not by evidence quality but by the speaker's position in hierarchies of race, gender, class, or nationality.

Fricker distinguished two forms:

Definition 9.18 (Forms of Epistemic Injustice)**. Testimonial injustice:** a speaker's testimony is given less credibility than it deserves due to prejudice against their social identity. In doxonomic terms: C_k is reduced by an identity penalty δ_{id}, so that $C_k^{\text{eff}} = C_k - \delta_{\text{id}}(k)$.

Hermeneutical injustice: a gap in collective interpretive resources prevents a group from making sense of their own experience in a way that would be communicable to others. In doxonomic terms: the narrative space $\mathcal{N}$ lacks the concepts needed to articulate certain forms of experience (e.g., "sexual harassment" before the term was coined; "structural racism" before the concept was developed).

This means that some agents face a structural credibility deficit: their testimony about lived experience is discounted, their counter-narratives are dismissed as "anecdotal," and their epistemic labor is uncompensated. Epistemic injustice is fourth-dimensional doxonomic power: it does not merely suppress specific beliefs but shapes the rules of whose evidence counts and which experiences are nameable.

Example 9.19 (Hermeneutical Injustice and the Delay of Concepts). Workers in the early industrial period experienced exploitation but lacked the conceptual vocabulary to articulate it as *exploitation* (a systematic extraction of surplus value) rather than as personal misfortune. The development of Marxian economic vocabulary provided hermeneutical resources that made collective experience communicable, and therefore politically actionable. Similarly, the concept of "emotional labor" (Hochschild, 1983) gave service workers a way to name an experience that had been structurally invisible. In doxonomic terms, concept creation is an investment in expanding $\mathcal{N}$: it makes previously unspeakable experiences articulable, which is a precondition for any counter-narrative.

9.6 Measuring Doxonomic Power

Power is notoriously difficult to measure. Doxonomic power is no exception, but several proxies are available.

Definition 9.20 (Doxonomic Power Index)**.** The *doxonomic power index* of agent a is

$$\text{DPI}(a) = \sum_{d=1}^{4} \omega_d \cdot P_d(a)$$

where $P_d(a)$ is a's capacity at dimension d and ω_d are weights reflecting the relative effectiveness of each dimension ($\omega_4 > \omega_3 > \omega_2 > \omega_1$). Component proxies:

- P_1: funding for direct advocacy and persuasion campaigns.
- P_2: control over editorial positions, curriculum committees, and algorithmic curation.
- P_3: investment in educational institutions, childhood media, and cultural production.
- P_4: control over professional norms, research funding allocation, and epistemic gatekeeping positions.

Remark 9.21. The doxonomic power index is a heuristic, not a validated metric. Its components are difficult to measure independently, and the weights ω_d are not empirically determined. It is included here as a framework for thinking about power comparisons, not as a tool ready for deployment. Developing reliable measurement of doxonomic power is an open problem (Chapter 36).

9.7 Power and Resistance

Doxonomic power is never total. Every exercise of power generates potential resistance, and the relationship between power and resistance is dynamic.

Principle 9.22 (Power-Resistance Dialectic)**.** Doxonomic power generates its own opposition through at least three mechanisms:

1. **Experiential contradiction**: when the lived experience of a population systematically contradicts the dominant narrative, the gap generates skepticism, frustration, and counter-narrative demand.
2. **Reflexive awareness**: doxonomic analysis itself (including this textbook) can make the mechanisms of power visible, reducing their effectiveness. Power that is seen as power loses the appearance of naturalness.
3. **Counter-institutional building**: subordinate groups build their own narrative infrastructure (labor unions, community organizations, alternative media, religious communities) that partially insulates their members from dominant narrative exposure.

Remark 9.23. This dialectic does not guarantee that resistance succeeds. The outcome depends on the relative resources, infrastructure, and strategic competence of the dominant and counter-doxonomic forces. But it does mean that doxonomic equilibria are never perfectly stable: they require continuous maintenance investment (the maintenance cost of capture, Chapter 8).

9.8 Notes and References

Lukes (2005) provides the three-dimensional framework; the fourth dimension is original to this text but draws on Foucault's analysis of power/knowledge (Foucault 1981). The propaganda model is in Herman and Chomsky (1988).

Structural power without conspiracy is analyzed in Gramsci (1971) and formalized in network terms by Jackson (2008). On the role of economics in shaping priors, see Bowles and Gintis (2011) and Mirowski and Plehwe (2009). On epistemic injustice, see Fricker (2007) and Medina (2013). On colonial knowledge production as an exercise of doxonomic power, see Said (1978) and Fanon (1961).

The production of ignorance (agnotology) is documented in Oreskes and Conway (2010). On the strategic manufacture of doubt, see also Proctor (2011), *Golden Holocaust*. For the economics profession as an exercise of epistemic rule-setting, see Mirowski and Plehwe (2009) and Mudge (2018). On performativity (how economic models reshape the reality they claim to describe), see MacKenzie (2006). The narrative range result (Proposition 9.8) is related to the Hotelling model of product differentiation; see also Hallin and Mancini (2004) on media system variation. Comparative media systems provide natural experiments for testing the relationship between funding diversity and narrative range (Hallin and Mancini 2004).

9.9 Exercises

Exercise 9.1. Classify the following exercises of power by dimension: (a) a pharmaceutical company funding a medical journal, (b) a government classifying documents as secret, (c) an economics curriculum teaching rational self-interest as human nature, (d) a platform algorithm determining what counts as "trending," (e) a professional association defining the requirements for "evidence-based" practice, (f) a religious institution teaching children that a particular social hierarchy is divinely ordained. For each, explain why you placed it at that dimension.

Exercise 9.2. Using Model 9.7, show that if all institutions depend on the same advertising market, the equilibrium narrative range R is narrower than if institutions have diverse funding sources. Compute R for two scenarios: (a) one dominant advertiser, (b) ten equally sized advertisers with diverse preferences.

Exercise 9.3. Formalize the claim that prior-setting power compounds over generations. Using equations (9.1)–(9.2) with specific functional forms (e.g., linear), compute the generational multiplier $1/(1-\rho)$. For what value of γ (family vs. institutional weight) does a single generation of institutional investment shift priors by more than 50% permanently?

Exercise 9.4. Using the doubt-production model (Model 9.16), estimate the investment needed to maintain public doubt about a scientific consensus. Assume the consensus has $C_{\text{consensus}} = 0.9$, the contrarian has $C_{\text{contrarian}} = 0.3$, and the action threshold is $B_p > 0.7$. How much doubt investment F_{doubt} is needed to keep B_p below 0.7? How does this change if $C_{\text{contrarian}}$ rises to 0.5 (e.g., by funding the contrarian through a prestigious institution)?

Exercise 9.5. Identify three examples of hermeneutical injustice: cases where a group lacked the conceptual vocabulary to name their experience. For each, describe: (a) the experience that was unnamed, (b) the concept that was eventually developed, (c) the doxonomic effect of having vs. not having the concept.

Exercise 9.6. Compute the doxonomic power index DPI for three actors of your choice (e.g., a major foundation, a social media platform, a national curriculum authority). Justify your estimates for each component P_d. Which actor has the highest total power? Which has the most concentrated power (highest P_d at a single dimension)?

Exercise 9.7. The chapter argues that U.S. cable news exhibits structural alignment despite apparent diversity. Test this claim: choose three cable news networks and analyze a week of coverage on a specific policy topic. Measure the narrative range R (how different are their framings?) and compare it to the narrative range across, say, U.S. cable news vs. BBC vs. Al Jazeera on the same topic. Is the within-system range narrower than the between-system range?

Exercise 9.8. The power-resistance dialectic (Principle 9.22) claims that doxonomic power generates its own opposition. Give a historical example where this dialectic played out. Was the resistance successful? What determined the outcome?

CHAPTER 10

The Economics of Belief Production

> There is no such thing as a free market.
>
> Ha-Joon Chang

Belief production has costs, returns, market structures, and welfare effects. It can be analyzed with the same tools that economists use for any industry (cost functions, optimization, market concentration, externalities, public goods theory, and welfare analysis), with the crucial difference that the "product" is not a commodity but a state of mind, and the "consumer" may not know they are consuming.

This chapter applies economic analysis to the doxonomic system itself, asking: what does belief cost to produce, who earns the returns, how is the market structured, and what are the welfare consequences of concentrated reality production?

10.1 Cost Functions for Narrative Production

The first question of doxonomic economics: how much does it cost to shift a population's belief by a given amount?

Model 10.1 (Stylized Doxonomic Cost Function)**.** A simple candidate cost function for achieving belief level μ for proposition p through channel k is

$$c_k(\mu) = \frac{-\ln(1-\mu)}{C_k \cdot P_k}$$

This is a heuristic, not an empirically derived function. Its justification is qualitative: the last few percentage points of adoption are exponentially more

expensive than the first, because holdouts are more resistant, more isolated, or more committed to alternatives. The functional form is chosen for tractability. Empirical estimation of actual cost curves is an open problem for the field.

Remark 10.2 (Why Costs Are Convex). The convexity of $c_k(\mu)$ (the fact that it costs more to move from 90% to 95% adoption than from 50% to 55%) arises from several mechanisms:

- **Diminishing susceptibility**: early adopters are those with the lowest resistance ρ_j (Definition 4.19). Each subsequent "convert" is harder than the last.
- **Counter-mobilization**: as a narrative becomes dominant, counter-narratives crystallize around the remaining dissenters, who become more organized and more vocal.
- **Experiential resistance**: holdouts often have direct experience contradicting the narrative. A worker who has seen colleagues laid off despite hard work is resistant to meritocratic narratives at a level that no amount of institutional messaging can overcome.
- **Identity entrenchment**: for some holdouts, rejecting the dominant narrative has become part of their identity. Persuading them requires not just evidence but identity transformation, a far more expensive operation.

The total cost of achieving population-level belief $\mu(p) = \bar{\mu}$ using m channels is the solution to the *multi-channel cost minimization problem*:

$$\min_{\mu_1,\ldots,\mu_m} \sum_{k=1}^{m} c_k(\mu_k) \quad \text{subject to} \quad \sum_k w_k \mu_k = \bar{\mu} \tag{10.1}$$

where w_k is the population weight of group k. This is a convex optimization problem with a standard Lagrangian solution.

Proposition 10.3 (Equimarginal Cost Condition)**.** *The cost-minimizing allocation satisfies*

$$c_k'(\mu_k) = \lambda / w_k \quad \textit{for all active channels } k$$

where λ is the Lagrange multiplier on the population constraint. Channels with lower marginal cost (higher $C_k \cdot P_k$) should be pushed to higher adoption levels.

Example 10.4 (Cost Comparison: Two Channels). A funder targets a population-level belief of $\bar{\mu} = 0.7$ using two channels:

- Channel 1 (university program): $C_1 = 0.9$, $P_1 = 0.05$, serving 5% of population.
- Channel 2 (advertising): $C_2 = 0.2$, $P_2 = 0.6$, serving 60% of population.

The cost functions are $c_1(\mu) = -\ln(1-\mu)/0.045$ and $c_2(\mu) = -\ln(1-\mu)/0.12$. Channel 2 has lower cost per unit belief despite lower credibility, because its reach is 12 times higher. But the equimarginal condition dictates that

the *marginal* costs should be equalized: pushing both channels until the incremental cost of one more percentage point is the same through each. In practice, the university channel becomes cost-effective at the margin for the last few percentage points (converting the most resistant audiences), while advertising is cost-effective for the bulk of the population.

10.2 Ideological Return on Investment

If doxonomic production has costs, it also has returns. The *ideological return on investment* measures the doxonomic effect per dollar spent.

Definition 10.5 (Ideological ROI)**.** The *ideological return on investment* for belief p through channel k is

$$\text{IROI}_k(p) = \frac{\Delta B_p}{\Delta F_k} = \frac{C_k \cdot R_{k,p} \cdot P_k \cdot T_k}{c_k'(\mu)}$$

evaluated at the current belief level μ. The aggregate IROI is the weighted average across all active channels.

Proposition 10.6 (Decreasing IROI)**.** $\text{IROI}_k(p)$ *is decreasing in* $\mu(p)$*: beliefs that are already widely held offer lower marginal returns to additional investment. This creates an incentive to diversify across beliefs or to shift from persuasion to maintenance once capture is achieved.*

Proof. The denominator $c_k'(\mu) = 1/((1-\mu)C_k P_k)$ is increasing in μ. Therefore IROI_k is decreasing in μ. As $\mu \to 1$, $c_k'(\mu) \to \infty$ and $\text{IROI}_k \to 0$: the last few holdouts are infinitely expensive to convert. □

Remark 10.7 (IROI and Strategic Behavior). The decreasing-IROI property has strategic implications. A rational doxonomic investor should:

1. invest in under-served beliefs (low μ, high IROI) rather than saturated ones,
2. shift spending from persuasion to maintenance once a belief approaches capture,
3. diversify across the ideological bundle (Definition 2.3) rather than concentrating on a single proposition,
4. invest in infrastructure (high-T channels) early, when costs are low, and shift to maintenance (low-cost monitoring) later.

This matches observed doxonomic behavior: the conservative movement invested heavily in infrastructure in the 1970s–1980s (high IROI, low initial μ) and shifted to maintenance and extension in the 2000s–2010s (Mayer 2016).

10.3 The Market for Belief: Supply and Demand

Belief production can be modeled as a market with supply (narrative production by institutions) and demand (audience willingness to adopt narratives).

Model 10.8 (Doxonomic Market)**. Supply side**: institutions produce narrative at a cost that increases with volume (convex cost functions). The supply curve for belief p is the marginal cost of producing an additional unit of narrative exposure: $MC(\Theta) = c'(\Theta)$, increasing in throughput Θ.

Demand side: funders demand belief change. Their willingness to pay is determined by the expected benefit of the belief change: political advantage, regulatory relief, consumer behavior modification, labor compliance, or ideological satisfaction. The demand curve is $WTP(\mu) = b'(\mu)$, where $b(\mu)$ is the private benefit to the funder of belief level μ.

Equilibrium: the market clears where $MC = WTP$, determining the equilibrium level of narrative production and the equilibrium belief level.

Proposition 10.9 (Market Failure in Belief Production)**.** *The doxonomic market fails in at least four ways:*

1. ***Externalities****: the social costs of dominant beliefs (reduced trust, suppressed cooperation, tolerating inequality) are not borne by the funders who produce them. Funders overproduce belief relative to the social optimum.*
2. ***Information asymmetry****: audiences cannot easily assess the quality, funding source, or accuracy of the narratives they consume. The epistemic lemons problem (Proposition 6.20) applies.*
3. ***Public-good character****: belief is non-excludable and partially non-rival, leading to under-provision of beneficial beliefs (accurate information, cooperative norms) and over-provision of privately beneficial but socially harmful beliefs.*
4. ***Monopoly power****: high concentration (*EHI*) gives dominant institutions price-setting and narrative-setting power, analogous to monopoly pricing in commodity markets.*

Remark 10.10 (Why the Market Metaphor Is Imperfect). The market model is useful but incomplete. Unlike commodity markets:

- the "consumer" (audience member) often does not know they are in a market,
- the "product" (belief) changes the consumer rather than the consumer choosing the product,
- there is no price signal (beliefs are not purchased but absorbed),
- demand is partly endogenous (funders can create demand for their own narratives by creating the social conditions that make those narratives appealing).

The market metaphor illuminates cost structures and concentration, but it should not be taken to imply that belief production is a voluntary transaction between informed parties.

10.4 Belief as Public Good or Public Bad

Beliefs are non-excludable (you cannot prevent someone from adopting a freely circulating narrative) and partially non-rival (one person's belief does not deplete the narrative). This gives beliefs the structure of a *public good*, or, when harmful, a *public bad*.

Definition 10.11 (Doxonomic Externality)**.** A *doxonomic externality* arises when a subsidized belief p imposes costs (or benefits) on agents who did not choose to produce or receive it.

Example 10.12 (Negative Doxonomic Externalities).

- The belief "human nature is selfish" reduces cooperative behavior in public goods settings, imposing costs on everyone through lower social trust, weaker collective action, and reduced provision of public goods (Fischbacher et al. 2001).
- The belief "poverty reflects personal failure" reduces political support for safety nets, imposing costs on low-income populations through reduced transfers and services.
- The belief "regulation kills jobs" delays environmental and safety regulation, imposing costs through pollution, workplace injury, and financial instability.
- The belief "there is no alternative to the current system" suppresses political imagination, imposing costs through democratic atrophy.

In each case, the funder benefits from the belief (lower taxes, less regulation, cheaper labor) while the social costs are distributed across the population.

Example 10.13 (Positive Doxonomic Externalities). Not all doxonomic externalities are negative:

- Public health campaigns that increase belief in vaccine safety generate positive externalities through herd immunity.
- Narratives promoting cooperative norms increase social trust, benefiting third parties.
- Accurate scientific communication about climate change, if internalized, generates benefits through better collective action.

Positive doxonomic externalities are under-produced by the market (the funder cannot capture all the benefits), just as negative externalities are over-produced (the funder does not bear all the costs). This is the standard public-goods logic applied to belief.

Theorem 10.14 (Welfare Loss from Doxonomic Externalities)**.** *If the social cost of belief p is $D(\mu(p))$ (increasing and convex in adoption level) and private*

funders do not internalize this cost, the equilibrium adoption level μ^* exceeds the social optimum μ^{**}:

$$\mu^* > \mu^{**} \quad \textit{where} \quad \mu^{**} = \arg\min_{\mu} [c(\mu) + D(\mu)]$$

The welfare loss (deadweight loss) is

$$W = \int_{\mu^{**}}^{\mu^*} [D'(\mu) - c'(\mu)]\, d\mu > 0$$

Proof. The private funder minimizes $c(\mu)$ and ignores $D(\mu)$, producing at μ^* where $c'(\mu^*) = b'(\mu^*)$ (marginal cost equals marginal private benefit). The social planner minimizes $c(\mu) + D(\mu)$, producing at μ^{**} where $c'(\mu^{**}) + D'(\mu^{**}) = b'(\mu^{**})$. Since $D'(\mu) > 0$, the social planner's first-order condition is satisfied at a lower μ, so $\mu^{**} < \mu^*$. The welfare loss is the integral of the gap between social marginal damage and private marginal cost over the over-production interval. □

Example 10.15 (Welfare Loss: Selfish-Human-Nature Narrative). Suppose the belief "human nature is selfish" has:

- Private benefit to funders (reduced regulation, lower labor costs): $b(\mu) = 10\mu$ (in billions \$/year).
- Production cost: $c(\mu) = -5\ln(1-\mu)$ (in billions \$/year).
- Social damage (reduced trust, cooperation, public goods): $D(\mu) = 8\mu^2$ (in billions \$/year).

The private optimum: $c'(\mu^*) = b'(\mu^*)$ gives $5/(1-\mu^*) = 10$, so $\mu^* = 0.5$. The social optimum: $c'(\mu^{**}) + D'(\mu^{**}) = b'(\mu^{**})$ gives $5/(1-\mu^{**}) + 16\mu^{**} = 10$, yielding $\mu^{**} \approx 0.28$. The welfare loss is $W = \int_{0.28}^{0.5} [16\mu - 5/(1-\mu) + 10]\, d\mu \approx$ \$1.8B/year. These numbers are illustrative, not calibrated. But the structure is real: the private optimum overshoots the social optimum by a wide margin because the funder does not bear the social damage.

10.5 Doxonomic Pigouvian Correction

In standard economics, externalities are corrected by a Pigouvian tax: a tax equal to the marginal social damage, which forces the producer to internalize the cost. The doxonomic analogue would be:

Model 10.16 (Doxonomic Pigouvian Tax)**.** A *doxonomic Pigouvian tax* on belief production would impose a per-unit charge of $t^* = D'(\mu^{**})$ on each unit of doxonomic throughput. Under this tax, the funder's problem becomes $\min_\mu [c(\mu) + t^* \Theta(\mu)]$, which aligns the private optimum with the social optimum.

Remark 10.17 (Why Pigouvian Correction Is Difficult). In practice, a doxonomic Pigouvian tax faces severe implementation problems:

1. **Measurement**: social damage $D(\mu)$ is extremely difficult to estimate. What is the dollar value of reduced social trust?
2. **Attribution**: linking a specific funding flow to a specific belief change to a specific social cost requires the full doxonomic accounting chain (Chapter 14).
3. **Free speech**: in many jurisdictions, taxing speech or belief production raises constitutional issues.
4. **Political feasibility**: the actors who would be taxed are the same actors with the most doxonomic power (Chapter 9).

More feasible policy instruments include: mandatory disclosure of doxonomic funding (transparency), public-interest counter-investment (subsidizing alternative narratives), structural reform of narrative infrastructure (media ownership limits, public broadcasting mandates), and educational intervention (doxonomic literacy curricula). See Chapter 33.

10.6 Epistemic Herfindahl Index

Definition 10.18 (EHI)**.** The *epistemic Herfindahl index* is

$$\text{EHI} = \sum_{k=1}^{m} s_k^2 \qquad \text{where} \qquad s_k = \frac{\Theta_k}{\sum_j \Theta_j}$$

and $\Theta_k = F_k \cdot C_k \cdot P_k$ is the effective doxonomic throughput of channel k.

High EHI indicates a concentrated market for reality production, in which a small number of institutions control most of the population's narrative exposure. In standard antitrust economics, HHI > 0.25 signals high concentration. Whether the same threshold applies to belief production is an empirical question: narrative markets differ from commodity markets in credibility dynamics, network effects, and audience resistance. We adopt EHI > 0.25 as a provisional warning indicator, not as a settled regulatory standard.

Proposition 10.19 (Concentration and Welfare)**.** *High* EHI *worsens doxonomic welfare in two ways:*

1. ***Monopoly pricing of credibility****: dominant institutions can charge higher "prices" (extract more concessions from funders) for their credibility services, but they pass this rent to the funder rather than to the public in the form of better quality.*
2. ***Reduced narrative diversity****: concentrated markets produce narrower narrative range (Proposition 9.8), which reduces the public's access to alternative framings and increases the risk of common-sense capture.*

10.7 Subsidy Structures and Hidden Transfers

Much doxonomic spending is invisible because it is structured as tax-exempt philanthropy, corporate sponsorship, or institutional cross-subsidy. These structures mean that the public co-finances belief production without choosing to do so.

Model 10.20 (Hidden Doxonomic Transfer)**.** Let a corporation spend S on think-tank funding, structured as a tax-deductible charitable contribution. The effective doxonomic transfer has two components:

- The corporation's net cost: $S \cdot (1 - t)$ where t is the marginal tax rate.
- The public subsidy: $S \cdot t$, representing foregone tax revenue that would otherwise fund public services.

Society effectively co-finances the doxonomic investment: for every dollar the corporation spends on narrative production, taxpayers contribute $t/(1 - t)$ additional dollars through the tax deduction. At a 21% corporate rate, the public co-investment is about 27 cents per dollar.

Example 10.21 (Scale of Hidden Transfers). In the United States:

- Total grants by the top 50 conservative foundations exceeded $1 billion/year in the 2010s (Mayer 2016).
- Donor-advised funds (which allow anonymous, tax-deductible giving) held over $230 billion in assets by 2022.
- Corporate lobbying expenditure (partially deductible) exceeded $4 billion/year.
- 501(c)(4) "social welfare" organizations (which can engage in unlimited political spending without disclosing donors) spent hundreds of millions in election years.

The tax subsidy to ideological production is not a minor accounting detail. It is a structural feature of the doxonomic system: society partially funds the production of beliefs whose content is chosen by private actors.

Remark 10.22 (Progressive vs. Regressive Doxonomic Subsidies). Tax deductions for charitable giving are regressive in their doxonomic effects: a dollar of giving by a high-income donor produces a larger tax subsidy than a dollar of giving by a low-income donor (because higher marginal tax rates yield larger deductions). This means the public co-investment in belief production disproportionately amplifies the narrative preferences of the wealthy. A flat tax credit (rather than a deduction) would be doxonomically more equitable, though it would reduce total philanthropic giving.

10.8 The Doxonomic Balance Sheet

Combining the concepts of this chapter, we can sketch a national-level doxonomic balance sheet:

Model 10.23 (National Doxonomic Balance Sheet)**.**

Doxonomic Expenditure Category	**Est. Annual (US, $B)**
Advertising (narrative component)	∼300
Lobbying and political spending	∼15
Think-tank and foundation grants	∼5
Public relations industry	∼20
Education (doxonomic component)	difficult to separate
Entertainment (narrative component)	difficult to separate
Religious institutions	difficult to separate
Platform algorithmic curation	not directly priced
Total identifiable	∼340+

This is a lower bound. The "difficult to separate" categories (education, entertainment, religion) collectively dwarf the identifiable categories in doxonomic effect, but their belief-production component cannot be cleanly isolated from their other functions.

Remark 10.24. The balance sheet reveals an asymmetry: identifiable doxonomic spending (advertising, lobbying, think tanks, PR) is dominated by private actors with concentrated interests. Public counter-investment (public broadcasting, civic education, public-interest media) is a small fraction. The doxonomic playing field is tilted by this asymmetry, and the tilt is itself a product of prior doxonomic success (beliefs about "small government" reduce political support for public counter-investment).

10.9 Notes and References

The economics of public goods and externalities draws on Stiglitz (2012) and Arrow (1963). The market for ideas framework is from Coase (1974). Media market concentration is analyzed in Bagdikian (2004) and McChesney (1999). The Herfindahl index originates in Herfindahl (1950). On manipulation as an economic phenomenon, see Akerlof and Shiller (2015). The political economy of think-tank funding is documented in Mayer (2016).

Pigouvian taxation for externalities is a standard result in welfare economics; see Stiglitz (2012). For the specific challenges of taxing speech and information externalities, see Sunstein (1993) and Sunstein (2017). On donor-advised funds and dark money structures, see Mayer (2016). The concept of a national doxonomic balance sheet is new to this text; related accounting concepts appear in national income accounting and media economics. For advertising expenditure data, WARC and eMarketer provide the standard industry estimates. On the regressive structure of charitable tax deductions, see the U.S. Congressional Budget Office reports on tax expenditures.

10.10 Exercises

Exercise 10.1. Compute EHI for the following hypothetical market: three channels with throughputs $\Theta_1 = 50$, $\Theta_2 = 30$, $\Theta_3 = 20$. Is this market concentrated by doxonomic standards? How does EHI change if a fourth channel enters with $\Theta_4 = 40$?

Exercise 10.2. A funder can invest \$10M in advertising ($C = 0.2$, $P = 0.6$, $T = 0.05$ years) or in university research ($C = 0.85$, $P = 0.05$, $T = 25$ years). Compute IROI for each channel, including the persistence factor. Under what conditions is the university investment more effective despite lower reach? What is the breakeven time horizon?

Exercise 10.3. Model the welfare loss from the belief "poverty reflects personal failure" using the damage function $D(\mu) = \alpha\mu^2$ where α represents the annual social cost of reduced safety-net spending per unit of meritocratic belief. Find the socially optimal belief level μ^{**} and the deadweight loss W. How does W change with α?

Exercise 10.4. Estimate the hidden public subsidy to ideological production through the U.S. 501(c)(3) tax exemption. If the top 50 conservative foundations distribute \$1B/year in grants at a 21% corporate tax rate and a 37% individual rate (for high-income donors), what is the total annual public co-investment? Who decides how this public money is spent?

Exercise 10.5. Design a doxonomic Pigouvian correction for the selfishness narrative. Estimate the marginal social damage $D'(\mu)$, propose a specific tax or subsidy structure, and discuss the implementation obstacles. Is a Pigouvian tax more or less feasible than direct counter-investment (public funding of cooperative-narrative infrastructure)?

Exercise 10.6. Construct a partial doxonomic balance sheet for your country. Estimate the identifiable doxonomic expenditure in at least four categories (advertising, lobbying, think tanks, public broadcasting). What is the ratio of private to public doxonomic investment? What does this ratio imply for narrative pluralism?

Exercise 10.7. The decreasing-IROI property implies that rational funders should diversify across the ideological bundle. Model a funder with three target beliefs (p_1, p_2, p_3) at initial adoption levels $\mu_1 = 0.8$, $\mu_2 = 0.3$, $\mu_3 = 0.1$. How should a \$10M budget be allocated across the three beliefs to maximize total belief impact?

Exercise 10.8. The market-failure proposition identifies four failures. For each, give a concrete real-world example and propose a specific policy intervention. Which interventions are most politically feasible? Which would be most effective?

CHAPTER 11

Formal Models of Doxonomic Systems

> A theory has only the alternative of being right or wrong. A model has a third possibility: it may be right, but irrelevant.
>
> Manfred Eigen

This chapter develops the mathematical core of doxonomics. The previous chapters introduced concepts (belief stocks, narrative flows, thresholds, lock-in, capture) using a mixture of formal definitions and qualitative argument. Here we build the dynamical models that give these concepts predictive structure.

Five model families are presented, each illuminating a different aspect of doxonomic dynamics: stock-and-flow models for aggregate belief trajectories, epidemiological models for narrative spread, Bayesian models for rational updating under asymmetric exposure, cascade models for sudden collective shifts, and competitive models for belief-versus-belief dynamics. The chapter closes with a guide to choosing among them.

A warning: all models in this chapter are stylized. They are designed to clarify mechanisms and generate testable predictions, not to reproduce empirical data with quantitative precision. Calibrating these models to real doxonomic systems is a major open problem. The Piatra Institute's computational playgrounds allow readers to explore each model's behavior under varying parameters.

11.1 Stock-and-Flow Models

The simplest dynamical model treats belief as a stock that accumulates or decays depending on narrative inflow and natural erosion.

Definition 11.1 (Belief Stock and Narrative Flow)**.** The *belief stock* $B_i(t) \in [0,1]$ is the fraction of the population holding belief i at time t. The *narrative flow* $\phi_i(t) \in \mathbb{R}_{\geq 0}$ is the rate at which narrative content supporting i is produced and circulated. The dynamics are:

$$\frac{dB_i}{dt} = \underbrace{\alpha \cdot \phi_i(t) \cdot (1 - B_i(t))}_{\text{institutional persuasion}} - \underbrace{\delta \cdot B_i(t)}_{\text{natural decay}} + \underbrace{\beta \cdot B_i(t)(1 - B_i(t))}_{\text{social reinforcement}} \tag{11.1}$$

where α is the persuasion rate (effectiveness of institutional narrative per unit flow), δ is the natural decay rate (belief erodes without reinforcement), and β is the social reinforcement rate (peer effects amplify belief through social proof).

Each term has a distinct doxonomic interpretation:

- The persuasion term $\alpha\phi(1 - B)$ captures institutional production. It is proportional to narrative flow ϕ and to the remaining persuadable fraction $(1 - B)$: as belief approaches 1, there are fewer people left to persuade.
- The decay term $-\delta B$ captures the natural erosion of belief absent reinforcement: memories fade, new generations arrive uninstructed, and contrary experience accumulates.
- The social reinforcement term $\beta B(1 - B)$ captures peer effects: holding a belief makes you more likely to transmit it to non-holders. This term is logistic, strongest when $B \approx 0.5$ and vanishing at the extremes.

11.1.1 Stability Analysis

Proposition 11.2 (Steady States and Stability)**.** *Setting $dB_i/dt = 0$ and writing $B = B_i$ for brevity, the steady states satisfy:*

$$\alpha\phi(1 - B) - \delta B + \beta B(1 - B) = 0$$

which is a quadratic in B:

$$-\beta B^2 + (\alpha\phi + \beta - \delta)B - \alpha\phi \cdot 0 = 0$$

Rearranging: $\beta B^2 - (\alpha\phi + \beta - \delta)B - \alpha\phi = 0$. The steady states are:

$$B^* = \frac{(\alpha\phi + \beta - \delta) \pm \sqrt{(\alpha\phi + \beta - \delta)^2 + 4\beta\alpha\phi}}{2\beta} \tag{11.2}$$

Remark 11.3 (Bistability Condition). The discriminant $\Delta = (\alpha\phi+\beta-\delta)^2+4\beta\alpha\phi$ is always positive (since $\beta, \alpha, \phi \geq 0$), so two real roots always exist when $\beta > 0$. However, only roots in $[0, 1]$ are physically meaningful. The system exhibits *bistability* (two stable equilibria separated by an unstable threshold) when β is sufficiently large relative to δ. Specifically, when $\beta > \delta$ and ϕ is in an intermediate range, there exist a low-belief stable equilibrium B^*_L and a high-belief stable equilibrium B^*_H, separated by an unstable equilibrium B^*_U. The basin of attraction of each stable equilibrium determines the system's response to perturbations.

The stability of each equilibrium is determined by the sign of $f'(B^*)$ where $f(B) = \alpha\phi(1 - B) - \delta B + \beta B(1 - B)$. We have:

$$f'(B) = -\alpha\phi - \delta + \beta(1 - 2B)$$

An equilibrium B^* is stable if $f'(B^*) < 0$ and unstable if $f'(B^*) > 0$.

11.1.2 Bifurcation Under Changing Funding

Proposition 11.4 (Funding Bifurcation)**.** *As the narrative flow ϕ increases from zero, the system undergoes a saddle-node bifurcation. Below a critical ϕ^*, only the low-belief equilibrium exists. At $\phi = \phi^*$, a pair of new equilibria appears (one stable, one unstable). Above ϕ^*, the system is bistable: the high-belief equilibrium is reachable if the initial condition or a temporary perturbation pushes B above the unstable threshold.*

This has a direct doxonomic interpretation: there is a *minimum funding level* below which no amount of social reinforcement can sustain a belief. Above that level, the belief can be "tipped" into a self-sustaining high-adoption equilibrium by a temporary burst of investment. Once tipped, the belief persists even if funding is subsequently reduced (as long as ϕ remains above the level needed to maintain the equilibrium, which may be much lower than the tipping level).

Example 11.5 (Numerical Example). With $\alpha = 0.3$, $\beta = 0.5$, $\delta = 0.1$:

- At $\phi = 0$: only $B^* = 0$ is stable (belief dies without support).
- At $\phi = 0.1$: $B^*_L \approx 0.08$ (low equilibrium), $B^*_H \approx 0.87$ (high equilibrium). The unstable threshold is $B^*_U \approx 0.35$.
- At $\phi = 0.5$: $B^*_H \approx 0.95$ (near-complete adoption); the low equilibrium has vanished.

The critical finding: at $\phi = 0.1$, a temporary shock that pushes adoption above 35% will cause the system to cascade to the high equilibrium, and stay there even after the shock ends. This is the formal model of the tipping-point phenomenon from Chapter 8.

11.2 Epidemiological Diffusion Models

Belief spread shares structural features with disease transmission: an "infected" individual can transmit the belief to "susceptible" contacts, and exposure can come from both peer contact and institutional sources.

Model 11.6 (SIR Model for Belief)**.** Partition the population into three compartments:

- $S(t)$: susceptible (have not encountered the narrative),
- $I(t)$: infected (actively hold and transmit the belief),
- $R(t)$: recovered (have encountered and rejected the belief, or lost interest).

With $S + I + R = 1$, the dynamics are:

$$\frac{dS}{dt} = -\beta SI - \alpha\phi(t)S \tag{11.3}$$

$$\frac{dI}{dt} = \beta SI + \alpha\phi(t)S - \gamma I \tag{11.4}$$

$$\frac{dR}{dt} = \gamma I \tag{11.5}$$

where β is the peer transmission rate, $\alpha\phi(t)$ is the institutional transmission rate (from narrative infrastructure), and γ is the recovery rate (skepticism, counter-narrative exposure, or simple loss of interest).

Definition 11.7 (Basic Reproduction Number)**.** The *doxonomic reproduction number* is

$$R_0 = \frac{\beta + \alpha\phi}{\gamma}$$

If $R_0 > 1$, the belief can spread epidemically from a small seed. If $R_0 < 1$, each "infected" individual transmits to fewer than one new adopter on average, and the belief dies out.

A crucial difference from epidemiology: institutions can maintain $\phi > 0$ indefinitely, sustaining beliefs that would otherwise die out. A belief with $\beta/\gamma < 1$ (peer transmission alone is insufficient) can persist if $\alpha\phi$ makes up the difference. This is the formal basis of the claim that some beliefs persist not because they are persuasive but because they are subsidized.

11.2.1 Endemic Equilibrium

Proposition 11.8 (Endemic Belief)**.** *When $R_0 > 1$ and institutional support is sustained ($\phi = const$), the belief reaches an* endemic equilibrium *where a constant fraction of the population holds the belief:*

$$I^* = 1 - \frac{1}{R_0} = 1 - \frac{\gamma}{\beta + \alpha\phi}$$

This is the doxonomic analogue of an endemic disease: the belief is never universally held but never disappears, maintained by the combination of peer transmission and institutional support.

Example 11.9 (Endemic vs. Epidemic Belief). Consider two scenarios:

- **Epidemic belief** (high R_0): a viral conspiracy theory with $\beta = 0.3$, $\gamma = 0.1$, $\alpha\phi = 0$. $R_0 = 3$; the belief sweeps through the susceptible population rapidly but then decays as the recovery rate takes effect. Peak I is high but transient.
- **Endemic belief** (moderate R_0, sustained ϕ): the belief "markets are efficient" with $\beta = 0.05$, $\gamma = 0.02$, $\alpha\phi = 0.03$. $R_0 = 4$; the belief reaches a stable endemic level $I^* = 0.75$ and stays there indefinitely. It never goes viral but never fades either.

The epidemic belief is dramatic but ephemeral. The endemic belief is quiet but permanent. Doxonomic systems aim for endemic stability, not epidemics.

11.2.2 The SIRV Model: Inoculation

Model 11.10 (SIRV Model with Inoculation)**.** Adding a "vaccinated" compartment $V(t)$ representing people who have received counter-narrative inoculation (Chapter 32):

$$\frac{dS}{dt} = -\beta SI - \alpha\phi S - \nu S \tag{11.6}$$

$$\frac{dV}{dt} = \nu S - \eta V I \tag{11.7}$$

$$\frac{dI}{dt} = \beta SI + \alpha\phi S + \eta V I - \gamma I \tag{11.8}$$

$$\frac{dR}{dt} = \gamma I \tag{11.9}$$

where ν is the inoculation rate and $\eta \ll \beta$ is the reduced transmission rate for inoculated individuals ($\eta < \beta$ because inoculation provides partial immunity but is not perfect).

The effective reproduction number with inoculation is:

$$R_{\text{eff}} = \frac{(\beta + \alpha\phi)S^* + \eta V^*}{\gamma}$$

Inoculation reduces R_{eff} by moving people from S to V, where they are harder to infect.

Remark 11.11 (Doxonomic Herd Immunity). If inoculation is sufficiently widespread, R_{eff} drops below 1 and the belief cannot sustain itself even with institutional support. The *doxonomic herd immunity threshold* is the fraction of the population that must be inoculated to prevent endemic belief:

$$V^* > 1 - \frac{1}{R_0}$$

This provides a quantitative target for counter-doxonomic educational programs: inoculate more than $1 - 1/R_0$ of the population, and the belief cannot persist at endemic levels.

11.3 Bayesian Updating Under Unequal Exposure

The epidemiological models treat belief adoption as binary (hold or don't hold). The Bayesian framework models belief as a continuous credence that evolves as agents receive signals from their information environment.

Model 11.12 (Asymmetric Information Environment)**.** Agent j observes a sequence of signals $\{s_t^{(j)}\}_{t=1}^{T}$ where each $s_t^{(j)}$ is drawn from

$$s_t^{(j)} \sim \begin{cases} \nu_j^+ & \text{with probability } q_j \\ \nu_j^- & \text{with probability } 1 - q_j \end{cases}$$

and q_j depends on j's media environment. Agents in channel k have $q_j = q_k$, determined by the channel's editorial stance. The parameter q_k captures the *exposure bias* of channel k: $q_k > 1/2$ means the channel favors proposition p; $q_k < 1/2$ means it favors $\neg p$; $q_k = 1/2$ means balanced exposure.

Theorem 11.13 (Polarization Under Asymmetric Exposure)**.** *If two groups A and B have $q_A > 1/2$ and $q_B < 1/2$ (their channels systematically favor opposite conclusions), then as $T \to \infty$:*

$$\pi_A^{(T)}(p) \to 1 \quad \textit{and} \quad \pi_B^{(T)}(p) \to 0$$

almost surely, even if both groups are perfectly rational Bayesian updaters starting from the same prior.

Proof. For group A, the log-likelihood ratio after T signals is:

$$\Lambda_A^{(T)} = \sum_{t=1}^{T} \log \frac{L(s_t \mid p)}{L(s_t \mid \neg p)}$$

Since $q_A > 1/2$, the expected log-likelihood ratio per signal is:

$$\mathbb{E}[\log L(s_t \mid p)/L(s_t \mid \neg p)] = q_A \log \frac{q_A}{1 - q_A} + (1 - q_A) \log \frac{1 - q_A}{q_A} = D_{\mathrm{KL}}(q_A \| 1 - q_A) > 0$$

By the strong law of large numbers, $\Lambda_A^{(T)}/T \to D_{\mathrm{KL}}(q_A \| 1 - q_A) > 0$ almost surely, so $\Lambda_A^{(T)} \to \infty$ and $\pi_A^{(T)}(p) \to 1$. The symmetric argument applies to group B with $q_B < 1/2$. The divergence rate is proportional to $D_{\mathrm{KL}}(q_A \| 1 - q_A) + D_{\mathrm{KL}}(q_B \| 1 - q_B)$. □

Remark 11.14. This theorem is the formal foundation for the claim that doxonomic polarization does not require irrationality, only asymmetric evidence supply. Two perfectly rational populations in different information environments will arrive at opposite conclusions with certainty. The doxonomic system controls q_k (the exposure bias of each channel); the rest is Bayes' rule doing its job.

Example 11.15 (Numerical Polarization). Two groups start with the same prior $\pi^{(0)} = 0.5$. Group A watches Channel X ($q_A = 0.7$): 70% of signals support p. Group B watches Channel Y ($q_B = 0.3$): only 30% of signals support p. After $T = 50$ signals:

- Group A: expected $\pi_A^{(50)} \approx 0.98$ (near-certain p is true).
- Group B: expected $\pi_B^{(50)} \approx 0.02$ (near-certain p is false).

Both groups are fully rational. Both have seen 50 pieces of "evidence." They disagree completely because they live in different information environments. If asked, each would say the other group is "ignoring the evidence." From their perspective, they would be right. This is doxonomic polarization in its purest form.

Remark 11.16 (Correlated Signals and Bounded Rationality). The theorem assumes conditionally independent signals. In practice, media content is highly correlated (outlets repeat each other, social media creates echo chambers, institutional sources are shared). Correlated signals carry less information per signal than independent ones, which means:

- the *perceived* evidence is stronger than the *actual* evidence (agents treat correlated signals as independent, over-counting),
- the polarization occurs faster than the theorem predicts (because agents are over-confident in their media-derived beliefs),
- de-polarization requires not just exposure to counter-signals but recognition that prior signals were correlated, a meta-cognitive step that most agents do not take spontaneously.

This is one reason why "just expose people to the other side" is a weaker intervention than doxonomic analysis might naively suggest. The problem is not insufficient exposure; it is the structure of the prior evidence environment.

11.4 Cascade Models

Model 11.17 (Information Cascade)**.** Following Banerjee (1992) and Bikhchandani et al. (1992), agents act sequentially, observing predecessors' actions but not their private signals. Each agent j receives a private signal $s_j \in \{+, -\}$ (favoring p or $\neg p$) and observes the actions $a_1, \ldots, a_{j-1}$ of all predecessors. Agent j's optimal action is:

$$a_j = \begin{cases} + & \text{if } \pi_j(p \mid s_j, a_1, \ldots, a_{j-1}) > 1/2 \\ - & \text{otherwise} \end{cases}$$

An *information cascade* occurs when the accumulated public evidence from predecessors' actions is so strong that agent j's optimal action is independent of j's private signal: the public evidence overwhelms private information.

Proposition 11.18 (Cascade Fragility)**.** *Information cascades are* informationally fragile*: they aggregate very little information. In a cascade, each agent's action reveals no new information (because the action is independent of the private signal). Therefore, the cascade is based on the signals of the few agents who acted before the cascade began, potentially as few as two or three. A single credible revelation of contradictory information can shatter the cascade.*

Remark 11.19 (Doxonomic Interpretation)*.* In doxonomic terms, a cascade occurs when the accumulated weight of institutional narrative is so strong that individual experience becomes irrelevant to expressed belief. Everyone acts as if p is true, not because the evidence is overwhelming, but because everyone else is acting as if p is true. This is precisely the pluralistic-ignorance configuration (Definition 2.8).

The fragility result (Proposition 11.18) has an important implication for regime fracture (Chapter 31): cascade-based consensus is dramatically more vulnerable to disruption than evidence-based consensus. A single whistleblower, a single scandal, or a single credible defection can trigger a *reverse cascade* (a rapid collapse of apparent consensus, as each agent, seeing others defect, reveals their own private doubt). This is the mechanism behind "preference cascades" and the "element of surprise in revolutions" (Kuran 1995).

11.5 Competitive Belief Dynamics

Most real doxonomic systems involve not one belief spreading through a population but multiple beliefs competing for the same audience.

Model 11.20 (Lotka-Volterra Belief Competition)**.** Let $B_1(t)$ and $B_2(t)$ be two competing beliefs, not necessarily summing to 1 (an agent can hold neither or both to some degree). The dynamics are:

$$\frac{dB_1}{dt} = B_1(\alpha_1\phi_1 - \gamma_1 - \beta_{12}B_2) \tag{11.10}$$

$$\frac{dB_2}{dt} = B_2(\alpha_2\phi_2 - \gamma_2 - \beta_{21}B_1) \tag{11.11}$$

where ϕ_k is the narrative flow for belief k, γ_k is the intrinsic decay rate, and β_{ij} is the competitive displacement rate (the degree to which belief j suppresses belief i).

11.5.1 Equilibrium Analysis

The system has four possible equilibria:

1. $(0, 0)$: both beliefs extinct. Always exists; stable when both $\alpha_k \phi_k < \gamma_k$.
2. $(B_1^*, 0)$: belief 1 dominates, belief 2 extinct. $B_1^* = (\alpha_1 \phi_1 - \gamma_1)/\beta_{12}$ if positive.
3. $(0, B_2^*)$: belief 2 dominates, belief 1 extinct.
4. (B_1^*, B_2^*): coexistence.

Proposition 11.21 (Competitive Exclusion)**.** *If $\beta_{12}\beta_{21} > (\alpha_1\phi_1 - \gamma_1)(\alpha_2\phi_2 - \gamma_2)/(B_1^* B_2^*)$, the coexistence equilibrium is unstable: one belief must exclude the other. The winner depends on initial conditions and funding levels. This is the doxonomic analogue of the* competitive exclusion principle *in ecology: two beliefs competing for the same "niche" (the same proposition space) cannot coexist indefinitely unless they differentiate.*

Proposition 11.22 (Funding Advantage and Dominance)**.** *If beliefs 1 and 2 have identical intrinsic properties ($\gamma_1 = \gamma_2$, $\beta_{12} = \beta_{21}$) but asymmetric funding ($\phi_1 > \phi_2$), then belief 1 dominates in the long run. Specifically, the critical condition for belief 1 to exclude belief 2 is:*

$$\alpha_1 \phi_1 - \gamma_1 > \beta_{21} \cdot \frac{\alpha_2 \phi_2 - \gamma_2}{\beta_{12}}$$

When the beliefs are symmetric in all respects except funding, this reduces to $\phi_1 > \phi_2$: the better-funded belief wins, regardless of intrinsic merit.

Remark 11.23 (When the Under-Funded Belief Survives). The under-funded belief ($\phi_2 < \phi_1$) can survive or even win if:

- it has lower intrinsic decay ($\gamma_2 < \gamma_1$), meaning it is more consistent with lived experience and requires less maintenance,
- it has stronger competitive displacement ($\beta_{21} > \beta_{12}$), meaning it is more effective at undermining the dominant belief per unit of contact,
- it occupies a different niche: rather than directly contradicting belief 1, it addresses a different aspect of the proposition space, enabling coexistence.

These conditions provide guidance for counter-doxonomic strategy (Chapter 32): when outspent, invest in resilience (γ reduction), efficiency (β enhancement), and niche differentiation rather than trying to match the dominant belief's funding.

11.6 Agent-Based Models

When analytical models become intractable (because of heterogeneous agents, network structure, multiple interacting beliefs, or complex institutional dynamics), agent-based models (ABMs) provide a computational alternative.

Model 11.24 (Doxonomic Agent-Based Model)**.** A doxonomic ABM consists of:

- N agents on a network $G = (V, E)$, each with a belief vector $\boldsymbol{\pi}_j \in [0,1]^n$ and attributes (group membership, resistance profile, media exposure),
- m institutional agents producing narrative at rates determined by funding,
- an exposure rule: at each time step, agent j is exposed to narratives from their network neighbors and from institutional channels,
- an update rule: agent j updates $\boldsymbol{\pi}_j$ according to the augmented internalization model (5.2) from Chapter 5,
- a feedback rule: aggregate beliefs influence institutional funding (closing the loop).

ABMs sacrifice analytical tractability for realism. They allow exploration of phenomena that are difficult to capture in closed-form models:

- **network effects**: beliefs spread differently on scale-free networks (hubs amplify) versus random networks (uniform diffusion),
- **community structure**: polarization emerges naturally from clustered networks where intra-group connections are denser than inter-group connections,
- **heterogeneous resistance**: different population segments respond differently to the same narrative, and the aggregate outcome depends on the distribution of resistance profiles,
- **strategic institutional behavior**: funders can adapt their strategies in response to observed belief dynamics, creating complex co-evolutionary dynamics.

Remark 11.25 (ABMs and the Playgrounds). The Piatra Institute's computational playgrounds implement several doxonomic ABMs with adjustable parameters. Readers can explore: how network topology affects polarization speed, how funding asymmetry determines competitive outcomes, how inoculation strategies perform against different epidemic dynamics, and how threshold distributions shape the conditions for capture. These simulations are designed to complement the analytical models of this chapter, not to replace them.

11.7 Model Comparison and Selection

With five model families available, the researcher must choose which is appropriate for a given doxonomic question. The following table provides guidance:

Model	Best for	Key assumption	Limitation
Stock-and-flow	Aggregate belief trajectories, tipping points, bifurcation analysis	Homogeneous population, well-mixed	No network structure, no individual heterogeneity
SIR/SIRV	Narrative spread dynamics, endemic equilibria, inoculation strategy	Compartmental (agents are S, I, or R)	Binary belief, no credence gradients
Bayesian	Polarization, filter bubbles, rational divergence under asymmetric exposure	Rational agents, independent signals	Ignores motivated reasoning, identity, affect
Cascade	Sudden collective shifts, fragile consensus, regime collapse	Sequential action, observable predecessors	Stylized; hard to calibrate to real populations
Lotka-Volterra	Belief competition, competitive exclusion, counter-narrative resilience	Competing beliefs interact through displacement	Aggregate; no within-population structure
ABM	All of the above with heterogeneity and network structure	Computational; requires parameter choices	Not analytically tractable; results are simulation-specific

Principle 11.26 (Model Selection)**.** Choose the simplest model that captures the mechanism under study. Use stock-and-flow for aggregate dynamics, SIR for spread phenomena, Bayesian for polarization, Lotka-Volterra for competition, cascades for sudden shifts, and ABMs when heterogeneity and network structure are essential. When in doubt, start with the analytical model and move to ABM only when the analytical model's assumptions are clearly violated by the empirical setting.

11.8 Notes and References

Stock-and-flow models adapt systems dynamics; for an introduction, see Sterman (2000). The SIR framework for information diffusion is developed in Watts (2002); for a comprehensive treatment of epidemic models on networks, see Pastor-Satorras et al. (2015). On the distinction between simple and complex contagion (behaviors that require multiple reinforcing contacts to spread), see Centola and Macy (2007) and Centola (2018). Continuous-state opinion-dynamics models (the closest neighbor to the stock-and-flow and Bayesian families) are surveyed in DeGroot (1974) and Hegselmann and Krause (2002).

Bayesian polarization under asymmetric information is treated in the economics of media bias (Gentzkow and Shapiro 2010); on rational herding, see Banerjee (1992). Cascade models originate with Banerjee (1992) and Bikhchandani et al. (1992); on cascade fragility, see also Chamley (2004). Lotka-Volterra models for cultural competition appear in the cultural evolution literature (Nowak 2006); the competitive exclusion principle is standard in mathematical ecology. Agent-based models in social science are surveyed in Salganik (2018) and Epstein (2006). Preference cascades and the element of surprise in regime collapse draw on Kuran (1995). Bifurcation theory for social tipping points connects to Schelling (1978). On the relationship between signal correlation and belief over-confidence, see Glaeser and Sunstein (2009). On the fragility of Bayesian agreement when agents disagree about the likelihoods of signals (not only about priors), see Acemoglu, Chernozhukov, et al. (2016).

11.9 Exercises

Exercise 11.1. For the stock-and-flow model (11.1) with $\alpha = 0.3$, $\delta = 0.1$, $\beta = 0.5$, find the minimum narrative flow ϕ^* needed for a stable high-adoption equilibrium to exist. Verify your answer by computing the steady states at $\phi = \phi^* - 0.01$ and $\phi = \phi^* + 0.01$.

Exercise 11.2. Compute R_0 for a belief spread through social media ($\beta = 0.05$, $\gamma = 0.2$) with institutional support $\alpha\phi = 0.1$. Can the belief sustain itself without institutional support ($\phi = 0$)? What is the endemic equilibrium I^* with and without institutional support?

Exercise 11.3. Simulate the Bayesian polarization theorem: generate $T = 100$ signals for two groups with $q_A = 0.7$ and $q_B = 0.3$, starting from the same prior $\pi^{(0)} = 0.5$. Plot the posterior trajectories. Now repeat with correlated signals (each signal is a copy of the previous one with probability 0.5). How does correlation affect the speed and confidence of polarization?

Exercise 11.4. In the Lotka-Volterra model with $\gamma_1 = \gamma_2 = 0.1$, $\beta_{12} = \beta_{21} = 0.3$, and $\alpha_1 = \alpha_2 = 0.2$, find the critical funding ratio ϕ_1/ϕ_2 above which belief 1 excludes belief 2. Interpret: how much must the dominant belief outspend the challenger to guarantee competitive exclusion?

Exercise 11.5. Extend the SIR model to include a "vaccinated" compartment $V(t)$ using Model 11.10. If $R_0 = 3$, what fraction of the population must be inoculated to achieve doxonomic herd immunity? What inoculation rate ν achieves this within 5 years?

Exercise 11.6. In a cascade of 20 agents, suppose agent 15 receives a highly credible counter-signal (a whistleblower revelation). Model the reverse cascade: if agent 15 defects, under what conditions do agents 16–20 follow? Under what conditions does the cascade withstand the shock?

Exercise 11.7. Design a doxonomic ABM with 1000 agents on a small-world network. Specify: two competing beliefs, one institutional funder for each, heterogeneous resistance profiles, and a feedback rule. Describe (qualitatively) what you expect to observe as you vary the funding ratio ϕ_1/ϕ_2 from 1:1 to 10:1. If you have access to a simulation environment, implement and run the model.

Exercise 11.8. The model comparison table provides guidance on when to use each model. For each of the following doxonomic questions, identify the most appropriate model family and justify your choice: (a) How does Fox News affect climate belief in the U.S.? (b) Can a counter-narrative survive against a 5:1 funding disadvantage? (c) Why did public support for austerity collapse so quickly in some countries after 2008? (d) What is the minimum inoculation rate to prevent anti-vaccine belief from reaching endemic levels?

CHAPTER 12

Contradiction, Fragmentation, and Sheaf-Like Coherence

> The test of a first-rate intelligence is the ability to hold two opposed ideas in the mind at the same time, and still retain the ability to function.
>
> F. Scott Fitzgerald

Real societies do not hold a single coherent ideology. They hold fragments: the workplace teaches competition, the family teaches care, the church teaches sacrifice, the market teaches acquisition, the school teaches meritocracy, the community teaches solidarity. These local belief systems often contradict each other. Yet the social order functions *as if* they were compatible. People move between institutional contexts daily (from the competitive office to the cooperative dinner table to the hierarchical church to the egalitarian friendship group) without experiencing a crisis of coherence at each transition.

How is this possible? This chapter uses sheaf-theoretic language to formalize how local coherence coexists with global contradiction, how ideology manages the seams, and what happens when the seams tear.

A note on mathematical level. This chapter uses concepts from algebraic topology (sheaves, Čech cohomology, obstruction classes). These concepts are applied here as a formal language for social phenomena, not as proven theorems about societies. The sheaf framework is *speculative* (it has not been empirically operationalized), but it is formally precise, and we believe it captures something important about ideological structure that other models miss. Readers without algebraic topology background can follow the definitions and examples; the cohomological proofs can be treated as black boxes on first reading.

12.1 Local Belief Systems

Definition 12.1 (Local Belief System)**.** Let $\mathcal{U} = \{U_1, \ldots, U_n\}$ be a cover of social life by institutional contexts (workplace, family, school, market, polity, religious community, peer group, online space, etc.). A *local belief system* on U_i is a consistent set of propositions $\sigma_i \in \Gamma(U_i, \mathscr{F})$ (a section of a sheaf $\mathscr{F}$ over U_i) specifying the operational norms, anthropological assumptions, and behavioral expectations within that context.

The key word is *consistent*. Within any single institutional context, the operative beliefs form a coherent package: the workplace's competitive individualism is internally consistent (self-interest, performance ranking, meritocratic reward), and the family's cooperative ethos is internally consistent (mutual care, sacrifice, unconditional support). The problem is not local inconsistency but *global* inconsistency: the packages contradict each other when placed side by side.

Example 12.2 (Contradictory Local Systems). Consider four contexts in a typical middle-class Western life:

- U_1 (workplace): σ_1 = "maximize personal advantage, compete, individuals are self-interested utility maximizers, your worth is your productivity"
- U_2 (family): σ_2 = "sacrifice for others, cooperate, persons are constitutively relational, your worth is intrinsic"
- U_3 (market): σ_3 = "choose rationally, express preferences through consumption, freedom is choice among options"
- U_4 (polity): σ_4 = "participate as a citizen, pursue the common good, freedom is collective self-governance"

Each is internally consistent. But on the overlaps:

- $U_1 \cap U_2$ (work-life balance): self-interest vs. sacrifice.
- $U_1 \cap U_4$ (political economy): "maximize advantage" vs. "pursue common good."
- $U_3 \cap U_4$ (democratic consumption): freedom as market choice vs. freedom as collective deliberation.

Remark 12.3 (Why Contradictions Are Not Noticed). Most people do not experience these contradictions as contradictions because:

1. **Contextual activation**: different contexts activate different belief systems, and the transition happens automatically (you don't "decide" to stop competing when you get home; you shift registers without deliberation).
2. **Temporal separation**: you experience contexts sequentially, not simultaneously, so the contradiction is temporally distributed.
3. **Narrative bridging**: ideology provides stories that connect the contradictions ("competing at work *is* caring for my family because I'm providing for them").

4. **Layer separation**: the contradictions often exist at different layers of the ontology (Principle 2.14). Propositional beliefs about policy may contradict practical schemas about behavior, but because they operate at different cognitive levels, the contradiction is not felt.

12.2 Sheaf-Theoretic Framework

The sheaf provides the mathematical language for formalizing how local consistency can coexist with global inconsistency.

Definition 12.4 (Belief Sheaf)**.** A *belief sheaf* is a sheaf $\mathscr{F}$ on the topological space $(\mathcal{U}, \tau)$ of institutional contexts, where:

- to each open set U_i, $\mathscr{F}$ assigns a set $\mathscr{F}(U_i)$ of consistent local belief systems,
- for $U_j \subset U_i$, there is a restriction map $\rho_{ij} : \mathscr{F}(U_i) \to \mathscr{F}(U_j)$ (restricting a belief system to a sub-context),
- the *sheaf condition* holds: if local sections $\sigma_i \in \mathscr{F}(U_i)$ agree on overlaps ($\rho_{ij}(\sigma_i) = \rho_{ij}(\sigma_j)$ on $U_i \cap U_j$ for all i, j), they glue to a global section $\sigma \in \mathscr{F}(\bigcup U_i)$.

The sheaf condition is the formal statement of coherence: if all the local systems agree where they overlap, they can be assembled into a single global system. The interesting case is when this condition *fails*: when local systems are individually consistent but cannot be glued.

Definition 12.5 (Gluing Obstruction)**.** A *gluing obstruction* exists when local sections are individually consistent but cannot be glued into a global section. Formally, the obstruction lies in the first Čech cohomology group $H^1(\mathcal{U}, \mathscr{F})$. When $H^1 \neq 0$, the society maintains local coherence without global consistency. The *dimension* $\dim H^1(\mathcal{U}, \mathscr{F})$ counts the number of independent obstructions: the number of independent contradictions that the society must manage.

Example 12.6 (Computing an Obstruction)*.* Consider the simplest non-trivial case: two overlapping contexts U_1 (workplace) and U_2 (family) with a non-empty overlap $U_{12} = U_1 \cap U_2$ (work-life decisions).

- On U_1: the local section σ_1 prescribes self-interested behavior.
- On U_2: the local section σ_2 prescribes other-regarding behavior.
- On U_{12}: the restriction $\rho_{1,12}(\sigma_1)$ prescribes self-interest; the restriction $\rho_{2,12}(\sigma_2)$ prescribes other-regard.
- Since $\rho_{1,12}(\sigma_1) \neq \rho_{2,12}(\sigma_2)$, the gluing condition fails.

The obstruction is the "disagreement" on the overlap: the difference $\rho_{1,12}(\sigma_1) - \rho_{2,12}(\sigma_2)$, which lives in $H^1(\mathcal{U}, \mathscr{F})$. In this two-set case, $\dim H^1 = 1$: there is one independent contradiction.

12.3 Ideology as Obstruction Management

If contradictions are structurally inevitable (because different institutions serve different functions and therefore embed different anthropological assumptions), the question is not how to eliminate them but how to *manage* them.

Theorem 12.7 (Ideology as Obstruction Management)**.** *A dominant ideology is a mechanism for managing non-trivial $H^1(\mathcal{U}, \mathscr{F})$. It does not eliminate contradictions. It provides narrative bridges (*transition maps*) that allow agents to move between contradictory local belief systems without experiencing the contradiction as a crisis.*

Proof sketch. Define transition maps $g_{ij} : U_i \cap U_j \to \mathrm{Aut}(\mathscr{F})$ that "translate" between local systems on overlaps. These maps form a Čech 1-cocycle: a collection of compatibility data specifying how local systems relate on overlaps. The ideology is effective if the cocycle is perceived as a coboundary, i.e., if agents experience the transition as natural rather than contradictory. Formally, the ideology "trivializes" the obstruction class in the agents' subjective experience, even though the cohomological obstruction $[g] \in H^1(\mathcal{U}, \mathscr{F})$ remains objectively non-zero. □

Example 12.8 (Transition Maps in Practice)*.* For the workplace-family contradiction ($U_1 \cap U_2$), ideology provides several transition maps:

- **"Providing"**: "I compete at work *for* my family. Self-interest in the marketplace is how I express care in the household." This map reinterprets workplace selfishness as a form of family altruism, bridging the contradiction.
- **"Separate spheres"**: "Work is work; home is home. Different rules apply in different places, and that's natural." This map does not resolve the contradiction but *compartmentalizes* it, making the inconsistency feel like appropriate context-sensitivity rather than incoherence.
- **"Meritocratic care"**: "The market rewards talent fairly, so my competitive success means I *deserve* to provide for my family. Competition and care are aligned." This map introduces meritocracy as a meta-narrative that reconciles the two local systems.

Each transition map has a different structure and a different doxonomic cost to maintain. "Providing" works as long as the job actually provides. "Separate spheres" works as long as the contexts don't overlap too much (it breaks when the boss calls during dinner, or when a child asks why parents are different at work). "Meritocratic care" works as long as the meritocratic premise is believed.

Remark 12.9 (Ideology Does Not Require Coherence; It Requires Management)*.* A common misunderstanding of ideology is that it provides a *coherent* worldview. The sheaf framework suggests otherwise: ideology's function is not to make the world logically consistent but to provide *transition maps*

that make the inconsistencies livable. A society does not need everyone to hold the same beliefs. It needs everyone to be able to *move between* contexts without experiencing cognitive crisis. This is a much lower bar than coherence, and it explains why ideological systems can persist despite obvious internal contradictions.

12.4 Managed Contradiction

Principle 12.10 (Productive Incoherence)**.** A doxonomic system benefits from moderate incoherence. Complete coherence would expose the system's commitments to systematic scrutiny ("if you believe X here and Y there, which is it?"). Complete incoherence would collapse social coordination (agents cannot function if every context is radically unpredictable). The optimal regime maintains enough local coherence for institutional functioning and enough global incoherence to prevent systematic critique.

Model 12.11 (Optimal Incoherence)**.** Let $h = \dim H^1(\mathcal{U}, \mathscr{F})$ measure the level of global incoherence. The stability of the doxonomic regime is

$$S(h) = \begin{cases} \text{low} & \text{if } h = 0 \text{ (fully coherent: visible, unified, critiquable)} \\ \text{high} & \text{if } 0 < h < h^* \text{ (managed contradiction: locally stable, globally opaque)} \\ \text{low} & \text{if } h > h^* \text{ (fragmentation: coordination fails)} \end{cases}$$

The regime is most stable at intermediate h, maintaining contradictions that are locally invisible.

Remark 12.12 (Why Full Coherence Is Dangerous for Power). If a doxonomic system were fully coherent (if "humans are selfish" were consistently applied in every institutional context), the implications would be visible and shocking. A fully coherent selfish anthropology would imply: no family obligation, no civic duty, no charitable giving, no trust. No real society has ever applied the selfish model consistently, because doing so would be socially unsustainable. The *inconsistency* is what makes the system livable: selfishness at work, care at home, duty in the military, charity on Sundays. The contradictions are not bugs; they are the mechanism by which an ideologically extreme anthropology can coexist with the practical demands of social reproduction.

Example 12.13 (Contradictions in Neoliberal Common Sense). Contemporary neoliberal common sense contains several managed contradictions:

1. **Freedom and submission**: "You are free to choose" (consumer sovereignty) coexists with "You must obey" (workplace hierarchy). Transition map: "You freely chose this job; workplace authority is contractual, not coercive."
2. **Meritocracy and inheritance**: "Success reflects talent and effort" coexists with massive inherited wealth. Transition map: "The wealthy

earned their money and can do what they want with it, including giving it to their children."

3. **Competition and cooperation**: "Competition drives excellence" coexists with "teamwork is essential" (in every corporate mission statement). Transition map: "We compete between firms and cooperate within firms."
4. **Individualism and nationalism**: "Individuals are the fundamental unit" coexists with "the nation is sacred." Transition map: "The nation is a voluntary association of free individuals who choose to identify together."

Each contradiction has an ideological bridge. Each bridge is under tension. Doxonomic investment is required to maintain the bridges, which is why ideological maintenance has ongoing costs (Chapter 8).

12.5 Fragmented Publics

When the transition maps break down (when agents can no longer smoothly move between contradictory local systems), the sheaf fails to cohere even locally. This is the condition of *epistemic fragmentation*: multiple publics inhabiting incommensurable belief worlds.

Definition 12.14 (Epistemic Fragmentation)**.** A population is *epistemically fragmented* if the cover $\mathcal{U}$ can be partitioned into disconnected components $\mathcal{U}_1, \ldots, \mathcal{U}_r$ such that no transition maps exist between components. In sheaf terms, $\mathscr{F}$ decomposes as a direct sum of sheaves on disconnected spaces:

$$\mathscr{F} \cong \mathscr{F}|_{\mathcal{U}_1} \oplus \cdots \oplus \mathscr{F}|_{\mathcal{U}_r}$$

Each component has its own internal coherence, but there is no common framework connecting them.

Fragmentation is distinct from pluralism. Pluralism means different beliefs coexist within a *shared* epistemic framework: agents disagree but can understand each other's positions and engage in meaningful debate. Fragmentation means the frameworks themselves are incommensurable: the concepts, categories, evidence standards, and even the perceived facts differ between components so radically that meaningful debate is impossible.

Example 12.15 (Fragmentation in Contemporary Politics)*.* The U.S. political landscape shows signs of fragmentation rather than mere polarization. It is not that liberals and conservatives disagree about policy (polarization); it is that they inhabit different informational realities:

- different media ecosystems with minimal overlap (Benkler et al. 2018),
- different factual premises (disagreement about what *happened*, not just what to do about it),
- different epistemic authorities (trust in different institutions, experts, and evidence sources),

- different core categories ("freedom" means different things in different political communities).

In sheaf terms, the two components have no transition maps between them: there is no narrative bridge that allows a member of one community to make sense of the other's positions within their own framework.

Proposition 12.16 (Fragmentation and Doxonomic Strategy)**.** *Epistemic fragmentation alters doxonomic strategy in several ways:*

1. ***Targeted production****: a funder can tailor narratives to specific fragments without worrying about consistency with narratives aimed at other fragments (since the fragments don't communicate).*
2. ***Reduced counter-pressure****: a narrative that dominates within one fragment faces no challenge from evidence or arguments circulating in another fragment.*
3. ***Democratic dysfunction****: fragmented publics cannot engage in collective deliberation, since they lack the shared premises required for productive disagreement.*
4. ***Manipulation vulnerability****: fragmented populations are more vulnerable to targeted manipulation (micro-targeting, personalized disinformation) because there is no shared information environment to provide a corrective baseline.*

12.6 The Dynamics of Coherence and Fragmentation

Societies can move along the coherence-fragmentation spectrum over time. The direction depends on the structure of narrative infrastructure, the availability of shared institutions, and the incentives of doxonomic actors.

Model 12.17 (Coherence Dynamics)**.** Let $C(t) \in [0,1]$ be a measure of epistemic coherence (the fraction of context-pairs connected by functioning transition maps). The dynamics are:

$$\frac{dC}{dt} = \underbrace{\alpha_{\text{shared}} \cdot I_{\text{shared}}(t)}_{\text{shared institutions}} - \underbrace{\beta_{\text{sort}} \cdot A(t)}_{\text{ideological sorting}} - \underbrace{\gamma_{\text{algo}} \cdot P(t)}_{\text{algorithmic fragmentation}} \tag{12.1}$$

where I_{shared} is the investment in shared narrative infrastructure (public broadcasting, common curricula, shared public spaces), $A(t)$ is the degree of ideological self-sorting (people choosing media and communities that confirm their existing beliefs), and $P(t)$ is the degree of algorithmic personalization (platforms creating individualized information environments).

Remark 12.18 (The Fragmentation Trend). In most Western democracies, I_{shared} has declined (public broadcasting defunded, common curricula fragmented, public spaces privatized) while $A(t)$ and $P(t)$ have increased (cable

news segmentation, social media echo chambers, algorithmic personalization). The model predicts $dC/dt < 0$: increasing fragmentation. This trajectory, if unchecked, leads from managed contradiction (livable incoherence) through polarization (stressed incoherence) to fragmentation (incommensurable disconnection). Reversing it would require renewed investment in shared institutions (I_{shared}) and regulation of algorithmic sorting ($P(t)$), which are themselves doxonomic investments subject to the political dynamics of Chapters 33 and 34.

12.7 Coherence, Power, and Critique

The sheaf framework has implications for both the maintenance of doxonomic power and the possibility of critical resistance.

Proposition 12.19 (Critique as Gluing Attempt)**.** *Critical analysis of ideology can be understood, in sheaf terms, as an attempt to* force the gluing*: to lay the local sections side by side and expose the contradictions that ideology's transition maps conceal. "You say people are selfish at work but cooperative at home,* which is it*?" This move threatens the doxonomic system because it makes the obstruction visible, transforming managed contradiction into experienced contradiction.*

Remark 12.20 (Why Critique Often Fails). Forcing the gluing is necessary for critique but not sufficient for change. Even when agents are shown the contradiction, they may:

- retreat to compartmentalization ("different rules for different contexts is just how life works"),
- adopt a meta-narrative that reframes the contradiction as a feature ("life is complex; only ideologues demand consistency"),
- experience discomfort but lack alternative local systems to replace the existing ones,
- acknowledge the contradiction intellectually while continuing to live within it practically (the gap between layers 1 and 3 of the ontology).

Effective critique requires not only exposing contradictions but providing *alternative local sections* that are locally consistent and globally more coherent, a far more demanding task that requires counter-institutional infrastructure (Chapter 32).

12.8 Notes and References

Sheaf theory is introduced in Bredon (1997) and Mac Lane and Moerdijk (1994); for applications to data analysis and network science, see Ghrist (2014) and Curry (2014). The application of sheaf-theoretic ideas to social systems is speculative and, as far as we know, original to this text in its doxonomic specificity. The concept of managed contradiction draws on Gramsci (1971)

(hegemony requires managing dissent, not eliminating it) and Bourdieu (1984) (the habitus manages contradictory practical demands without conscious deliberation). Čech cohomology and obstruction theory are standard in algebraic topology; see Bott and Tu (1982) for an accessible treatment. On epistemic fragmentation and filter bubbles, see Sunstein (2017) and Benkler et al. (2018). The idea that ideology manages rather than eliminates contradiction is central to Adorno and Horkheimer (1944) and to Slavoj Žižek's reading of ideology as a structure that "works" precisely because subjects do not fully believe it. On cognitive dissonance as the psychological mechanism for managing contradictions, see Festinger (1957). On the fragmentation of the American information environment, see Benkler et al. (2018) and Hallin and Mancini (2004).

The coherence dynamics model (equation 12.1) is new to this text and intentionally stylized. Its purpose is to identify the variables that drive coherence and fragmentation, not to make quantitative predictions. Empirical estimation would require measures of shared-institution investment, ideological sorting, and algorithmic personalization, all of which are partially available (public broadcasting budgets, audience overlap metrics, platform transparency data) but have not been integrated into a coherence index.

12.9 Exercises

Exercise 12.1. Construct a concrete belief sheaf for a society with three institutional contexts: market, family, and polity. Assign local sections to each, specifying at least three propositions per context. Identify the overlaps where contradictions arise. Attempt to construct a global section. If you fail, identify the obstructions.

Exercise 12.2. For the workplace-family contradiction, write three different transition maps (different from those in Example 12.8). For each, identify under what conditions it breaks down. Which transition map is most resilient? Which is cheapest to maintain?

Exercise 12.3. Model epistemic fragmentation in a polarized society. Define a cover with two disconnected components and show that no global section exists. What would "reunification" require in sheaf-theoretic terms? Is reunification always desirable, or are there cases where pluralism-without-coherence is preferable?

Exercise 12.4. Argue that the $\dim H^1$ measure of incoherence is related to the number of independent "contradictions" a society must manage. Give three examples of irreducible contradictions in contemporary capitalism. For each, identify the transition map (ideological bridge) that manages it.

Exercise 12.5. Using the coherence dynamics model (12.1), estimate plausible values for α_{shared}, β_{sort}, and γ_{algo} in a country of your choice. Is dC/dt positive

(increasing coherence) or negative (increasing fragmentation)? What policy interventions would reverse the sign?

Exercise 12.6. The chapter claims that full coherence is *dangerous for power* (Remark 12.12). Construct a thought experiment in which a society applies its dominant anthropological regime consistently across all institutional contexts. What happens? Why is the inconsistent version more stable?

Exercise 12.7. Apply Proposition 12.19 to a real ideological contradiction. Choose a specific contradiction, expose it (force the gluing), and predict the likely response using the four mechanisms in Remark 12.20. Design a critique strategy that addresses each mechanism. What institutional resources would you need?

Exercise 12.8. Compare two societies: one with a strong public broadcaster and common school curriculum (high I_{shared}), and one with entirely private media and school choice (low I_{shared}). Using the sheaf framework, predict the coherence level C of each. Which is more vulnerable to epistemic fragmentation? Which is more vulnerable to common-sense capture? Is there a tradeoff?

You now have the conceptual toolkit: epistemic capital, narrative infrastructure, common-sense capture, doxonomic power, belief markets, dynamical models, and the sheaf-theoretic framework for coherence and contradiction. These tools let you model *doxonomic systems formally. Part III asks: how would you* measure *them empirically? The methods chapters are the scientific backbone of the book: where the framework meets data.*

Part III

Methods

CHAPTER 13

Doxometric Measurement

> Not everything that counts can be counted, and not everything that can be counted counts.
>
> William Bruce Cameron

Doxonomics requires measurement. Without it, the field remains assertion, a collection of plausible claims about belief production that cannot be tested, compared, or refuted. This chapter develops the theory of *doxometrics*: the quantitative measurement of public belief, its intensity, distribution, and institutional embeddedness.

The central difficulty is that beliefs are *latent variables*. We do not observe them directly. We observe indicators (survey responses, behaviors, choices, texts, institutional practices) and must infer the underlying belief structure. This inference is never perfect, and the measurement challenges are at least as severe as those in any social science. Doxometrics must therefore be psychometrically serious: attentive to reliability, validity, bias, and the gap between what we measure and what we claim to measure.

13.1 What Counts as a Measurable Belief?

Definition 13.1 (Operationalized Belief)**.** A belief p is *doxometrically operationalized* when there exists a measurement function $m : \text{Pop} \to [0, 1]$ such that $m(j)$ approximates $\pi_j(p)$ with known reliability and validity. The population-level measure is $\hat{\mu}(p) = \frac{1}{N} \sum_{j=1}^{N} m(j)$.

Not all beliefs are equally measurable. The layered ontology (Principle 2.14) implies that different layers present different measurement challenges:

Layer	Measurement method	Difficulty
1. Propositional belief	Surveys, polls	Moderate (social desirability bias, framing effects)
2. Norm perception	Norm-elicitation surveys, vignettes	Moderate (perception $\neq$ reality)
3. Practical schema	Behavioral observation, reaction time	High (must be inferred from action, not report)
4. Identity commitment	Identity scales, ingroup/out-group tasks	Moderate-high (self-report may be performative)
5. Affective orientation	Implicit association tests, physiological measures	High (requires specialized equipment; validity debated)

Most doxometric work focuses on layer 1 because it is the most tractable. But the most consequential doxonomic products (deep anthropological regimes, embodied dispositions, affective prejudices) operate at layers 3–5, where measurement is hardest. This gap between what is most measurable and what is most important is the field's central methodological challenge.

13.2 Indicators and Proxies

Direct measurement of $\pi_j(p)$ is rarely possible. We distinguish four types of indicators, each with characteristic strengths and biases:

Stated belief: direct survey response ("Do you agree that human nature is selfish?"). *Strength*: easy to collect at scale. *Bias*: social desirability (respondents give "acceptable" answers), acquiescence (tendency to agree with any statement), framing effects (wording changes responses dramatically).

Behavioral marker: observed action consistent with p (e.g., defection rates in public goods games as a proxy for selfishness belief; willingness to cross a picket line as a proxy for individualist values). *Strength*: resistant to social desirability bias (actions are costly, so they reveal more than words). *Bias*: behavior is multiply determined (defection in a game may reflect strategic calculation, not belief about human nature).

Revealed preference: choices that imply p (e.g., voting for policies consistent with meritocratic belief; purchasing choices consistent with consumerist identity). *Strength*: based on high-stakes real-world decisions. *Bias*: preferences are not beliefs (I may vote for redistribution because it benefits me, not because I reject meritocracy).

Textual indicator: frequency and framing of p in media, social media, institutional documents, or personal communication. *Strength*: available at massive scale through computational methods. *Bias*: discourse fre-

quency is not belief prevalence (a proposition may be frequently discussed precisely because it is contested, not because it is believed).

Proposition 13.2 (Divergence of Indicators)**.** *Stated belief and behavioral markers may diverge systematically. A population may report cooperative values while behaving competitively (or vice versa). The gap* $|m_{stated}(p) - m_{behavioral}(p)|$ *is itself a doxonomic observable, measuring the* depth of internalization*.*

Remark 13.3 (The Divergence as Data). When stated belief exceeds behavioral compliance, the belief has not been internalized to layer 3 (practical schema): people profess it but do not enact it. When behavioral compliance exceeds stated belief, the belief may operate doxically (layer 5): people enact it without explicitly endorsing it. The gap between layers is not noise to be eliminated; it is signal about the depth and mode of doxonomic penetration.

Example 13.4 (Measuring Belief in Meritocracy). Four indicators for the belief "success reflects effort and talent":

1. **Stated**: Likert-scale agreement with "people who work hard almost always get ahead" (World Values Survey item).
2. **Behavioral**: willingness to assign unequal rewards in an experimental dictator game after observing performance differences.
3. **Revealed preference**: voting for politicians who oppose redistributive taxation.
4. **Textual**: frequency of meritocratic framing ("earned," "deserved," "self-made") in media coverage of wealth.

Each captures a different facet. A complete doxometric assessment uses all four and reports both the individual estimates and the divergences.

13.3 Measurement Bias and Correction

Several systematic biases plague doxometric measurement.

Definition 13.5 (Social Desirability Bias)**.** *Social desirability bias* (SDB) is the tendency of respondents to answer survey questions in a way that will be viewed favorably by others, rather than truthfully. In doxometric contexts, SDB causes under-reporting of socially disapproved beliefs (racism, selfish motivation) and over-reporting of socially approved beliefs (cooperation, fairness).

Correction strategies:

- **List experiments**: respondents report the number of statements they agree with from a list, rather than identifying which ones. The treatment group's list includes the sensitive item; the control group's does not. The difference in average counts estimates the prevalence of the sensitive belief without any individual revealing their answer.

- **Endorsement experiments**: respondents evaluate a policy endorsed by a figure associated with the belief. The endorsement effect measures implicit alignment without direct self-report.
- **Implicit measures**: reaction-time tasks (Implicit Association Test) measure automatic associations, bypassing deliberate self-presentation. *Caveat*: the reliability and validity of IATs for measuring beliefs (as opposed to associations) remains debated.
- **Behavioral validation**: compare survey responses with behavior in incentivized tasks. Respondents who claim to value cooperation but defect in public goods games are flagged as exhibiting SDB.

Definition 13.6 (Framing Bias)**.** *Framing bias* occurs when the wording of a survey question influences the response, independent of the underlying belief. "Do you believe in free enterprise?" and "Do you think corporations should be unregulated?" may target the same proposition but elicit different responses. Doxometric instruments should include multiple framings of the same target belief and report the framing sensitivity as a measure of measurement precision.

Definition 13.7 (Measurement Invariance)**.** A doxometric instrument satisfies *measurement invariance* across groups $G_1, \ldots, G_L$ if the relationship between latent belief and observed indicators is the same in each group. Formally: the factor loadings λ_k and intercepts are equal across groups (metric and scalar invariance). Without invariance, cross-group comparisons of belief levels are not meaningful: a higher score in group G_1 might reflect a stronger belief or a different relationship between the belief and the indicator.

Remark 13.8 (Why Invariance Matters for Doxonomics). Doxonomic analysis frequently compares belief levels across countries, classes, racial groups, or media environments. If the measurement instrument is not invariant across these groups (if "hard work leads to success" means something different to a white professional in Connecticut than to a Black factory worker in Detroit), then the comparison is spurious. Every cross-group doxometric comparison should be accompanied by an invariance test.

13.4 Latent Variable Models

Model 13.9 (Factor Model for Belief)**.** Let $\boldsymbol{y}_j = (y_{j1}, \ldots, y_{jK})$ be K observable indicators for agent j. The latent belief π_j generates observables via

$$y_{jk} = \lambda_k \pi_j + \varepsilon_{jk}$$

where λ_k is the factor loading for indicator k (how strongly the indicator reflects the latent belief) and $\varepsilon_{jk} \sim \mathcal{N}(0, \sigma_k^2)$ is measurement error. The latent belief is recovered as the weighted average:

$$\hat{\pi}_j = \frac{\sum_k \lambda_k y_{jk} / \sigma_k^2}{\sum_k \lambda_k^2 / \sigma_k^2}$$

This is the minimum-variance unbiased estimator under the model.

Proposition 13.10 (Reliability)**.** *The* reliability *of the latent belief estimate is*

$$Rel(\hat{\pi}) = 1 - \frac{\text{Var}(\hat{\pi} - \pi)}{\text{Var}(\hat{\pi})} = \frac{\sum_k \lambda_k^2/\sigma_k^2}{\sum_k \lambda_k^2/\sigma_k^2 + 1}$$

Reliability increases with the number of indicators K (more items $\to$ more signal) and with the factor loadings λ_k (stronger items $\to$ more signal), and decreases with measurement error variance σ_k^2. The standard threshold for acceptable reliability in psychometrics is $Rel > 0.70$.

Remark 13.11 (Beyond Single-Factor Models). The single-factor model assumes that all indicators load on a single latent belief. Many doxonomic beliefs are multi-dimensional. "Meritocratic belief" may decompose into: belief in effort $\to$ success, belief in equal opportunity, belief in desert-based distribution, and attribution of poverty to individual failure. These may be correlated but not identical. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) should be used to assess dimensionality before constructing composite indices. Treating a multi-dimensional construct as unidimensional produces unreliable and uninterpretable results.

13.4.1 Item Response Theory

For more refined measurement, item response theory (IRT) models the probability of endorsing each item as a function of the latent belief and item characteristics:

Model 13.12 (Two-Parameter IRT)**.** The probability that agent j endorses item k is

$$P(y_{jk} = 1 \mid \pi_j) = \frac{1}{1 + \exp(-a_k(\pi_j - b_k))}$$

where a_k is the *discrimination parameter* (how sharply the item distinguishes between high and low π_j) and b_k is the *difficulty parameter* (the belief level at which endorsement probability is 50%).

IRT improves on the factor model by allowing each item to have a different measurement precision at different points on the belief continuum. A well-designed doxometric instrument should include items with different difficulty parameters to measure accurately across the full range of belief levels, from strong disbelief through ambivalence to strong endorsement.

13.5 Composite Indices of Belief Dominance

Definition 13.13 (Doxonomic Dominance Index)**.** The *doxonomic dominance index* (DDI) for belief p is

$$\text{DDI}(p) = \alpha_1 \hat{\mu}(p) + \alpha_2 \cdot (1 - \text{Var}(\hat{\pi})) + \alpha_3 \cdot \text{InstEmbed}(p) + \alpha_4 \cdot \text{MediaFreq}(p)$$

where:

- $\hat{\mu}(p)$ is the population-mean belief (how widely held),
- $1 - \text{Var}(\hat{\pi})$ is the concentration of belief (how uniformly held),
- $\text{InstEmbed}(p)$ measures institutional embeddedness (how many institutions treat p as operational truth),
- $\text{MediaFreq}(p)$ is the normalized frequency of p in public discourse.

The weights α_i satisfy $\sum \alpha_i = 1$.

Remark 13.14 (DDI Limitations). The DDI is a *dashboard sketch*, not a validated index. The weights α_i are currently arbitrary; different weights produce different rankings. The components mix unlike quantities (survey proportions, variance measures, frequency counts) without a clear scaling doctrine. Before the DDI can serve as a serious research tool, it requires:

- empirical validation (does DDI predict policy outcomes, behavioral patterns, or other independently measurable consequences?),
- sensitivity analysis (how much do results change with different weight specifications?),
- normalization (each component should be on a comparable scale).

We include it here as a conceptual prototype, not as a finished instrument.

13.6 Measuring Institutional Embeddedness

The DDI requires a measure of institutional embeddedness: how deeply a belief is woven into the operational assumptions of institutions.

Definition 13.15 (Institutional Embeddedness)**.** The *institutional embeddedness* of belief p is

$$\text{InstEmbed}(p) = \frac{1}{|\mathcal{U}|} \sum_{U_i \in \mathcal{U}} \mathbf{1}[p \in \sigma_i]$$

where $\mathcal{U}$ is the set of institutional contexts and $\mathbf{1}[p \in \sigma_i] = 1$ if p functions as an operational assumption in context U_i.

Operationalizing this requires coding institutional practices, curricula, regulations, and organizational structures for the presence of p as an operational assumption, a qualitative judgment that can be systematized through:

- textbook analysis (does the economics curriculum assume rational self-interest?),

- organizational document analysis (do HR policies assume shirking? do compensation structures assume competitive motivation?),
- legal analysis (does regulatory framework assume market efficiency?),
- expert survey (do practitioners in a field report that p is a taken-for-granted assumption in their work?).

Example 13.16 (Embeddedness of "Rational Self-Interest"). Coding for the belief "agents are rational self-interest maximizers" across U.S. institutional contexts:

Institution	Embedded?	Evidence
Economics curricula	Yes	Textbook analysis
Corporate HR / compensation	Yes	Incentive-based pay design
Antitrust regulation	Yes	Consumer welfare standard
Criminal justice	Partial	Deterrence theory; also retributive
Public education	No	Assumes cooperation, development
Religious institutions	No	Assumes altruism, duty
Military	Partial	Hierarchy + unit solidarity
Family law	No	Assumes care, obligation

InstEmbed $\approx 3.5/8 = 0.44$. The belief is institutionally embedded in roughly half of major contexts, far from total, but substantial enough to function as a default assumption in public life.

13.7 Measuring Doxonomic Change Over Time

Doxonomic analysis requires not just snapshot measurement but the tracking of belief trajectories over time.

Definition 13.17 (Belief Trajectory)**.** The *belief trajectory* for proposition p is the time series $\{\hat{\mu}(p,t)\}_{t=0}^{T}$. A doxonomic event (a major campaign, a crisis, a curriculum reform) produces a detectable shift in the trajectory.

Sources for longitudinal belief data:

- **Repeated cross-sections**: World Values Survey (waves every 5 years since 1981), General Social Survey (annual/biennial since 1972), Eurobarometer (biannual since 1973).
- **Panel surveys**: tracking the same individuals over time (more informative but more expensive; subject to attrition).
- **Text time series**: media corpus analysis tracking narrative frequency and framing over decades (Google Ngrams, GDELT, Media Cloud).
- **Behavioral time series**: cooperation rates in experimental games, charitable giving rates, labor market indicators.

Remark 13.18 (Identifying Doxonomic Events in Time Series). A sudden shift in $\hat{\mu}(p,t)$ coinciding with a known doxonomic investment (a new think tank, a major ad campaign, a curriculum reform, a media ownership change) is *suggestive* but not *causal* evidence of doxonomic effect. Establishing causality requires the methods of Chapter 16: natural experiments, difference-in-differences, or synthetic controls that rule out confounding events. Time-series correlation between funding and belief is a starting point, not a conclusion.

13.8 Notes and References

Measurement theory for social science draws on King et al. (1994) and Gelman et al. (2020). Latent variable models and factor analysis are standard in psychometrics; see Bollen (1989) for the structural equation modeling framework. Item response theory is developed in Embretson and Reise (2000). Behavioral measures of beliefs about cooperation are developed in Fischbacher et al. (2001) and Henrich et al. (2001). Survey methodology for the digital age connects to Salganik (2018). On the divergence between stated and revealed preferences, see Kahneman (2011).

List experiments and other techniques for sensitive questions are reviewed in Blair, Imai, and Zhou (2015). The Implicit Association Test is from Greenwald, McGhee, and Schwartz (1998); for a critical assessment, see Oswald et al. (2013). Measurement invariance testing is covered in Meredith (1993) and Vandenberg and Lance (2000). For topic models as tools for measuring latent constructs in text, see Blei, Ng, et al. (2003) and Grimmer and Stewart (2013). On the distinction between discourse frequency and belief prevalence, see Zaller (1992): media coverage shapes the *accessibility* of considerations, not directly the *beliefs* of the audience.

13.9 Exercises

Exercise 13.1. Design a five-item survey instrument to measure belief in selfish human nature. Include at least two reverse-coded items. Specify the response format, argue for content validity, and describe how you would assess reliability and dimensionality.

Exercise 13.2. Using the factor model (Model 13.9), show that the reliability of the latent belief estimate $\hat{\pi}_j$ increases with the number of indicators K and decreases with measurement error variance σ_k^2. Compute the minimum K needed for Rel > 0.80 when $\lambda_k = 0.7$ and $\sigma_k = 0.5$ for all k.

Exercise 13.3. Compute the DDI for the belief "markets are efficient" using plausible estimates for each component. Then repeat with different weight specifications ($\alpha_1 = 0.5$ vs. $\alpha_1 = 0.1$). How sensitive is the DDI to the choice of weights? What does this imply about its usefulness?

Exercise 13.4. Design a list experiment to measure the prevalence of the belief "most poor people are poor because they are lazy" in a population where this belief is socially disapproved. Specify the control and treatment lists, the sample size calculation, and the estimator.

Exercise 13.5. A doxometric instrument measuring meritocratic belief is administered in the U.S. and Sweden. Describe how you would test for measurement invariance across the two countries. What would you conclude if configural invariance holds but scalar invariance fails? Can you compare mean belief levels across the two countries?

Exercise 13.6. Choose a specific belief (e.g., "inequality is natural"). For each of the five layers in the ontology (Principle 2.14), propose a concrete measurement method. Which layers are most important for doxonomic analysis? Which are most measurable? What is the gap between importance and measurability, and what does it imply for the field?

Exercise 13.7. Using publicly available World Values Survey data, plot the trajectory of belief in "hard work leads to success" in three countries over the past 30 years. Do you observe any doxonomic events (sudden shifts)? If so, what was happening in each country at the time of the shift?

Exercise 13.8. The chapter notes that discourse frequency is not the same as belief prevalence. Give an example where $\text{MediaFreq}(p)$ is high but $\hat{\mu}(p)$ is low, and vice versa. What does each configuration imply doxonomically?

CHAPTER 14

Belief-Flow Accounting

> Follow the money.
>
> Deep Throat (attr.)

If doxonomics is to be a science rather than a commentary, it needs accounting. The claim that "beliefs are funded" is empty without a ledger: who spent how much, through which institutions, producing which narratives, reaching which audiences, with what measurable effects. This chapter develops the framework for tracing financial flows into narrative outputs: the doxonomic ledger.

Belief-flow accounting is to doxonomics what national income accounting is to macroeconomics: a systematic method for measuring aggregate flows. Just as GDP accounting tracks the flow of goods and services through an economy, doxonomic accounting tracks the flow of resources through the belief production chain. The analogy is not perfect (narrative production is harder to measure than automobile production), but the aspiration is the same: replace impressionistic claims with documented flows.

14.1 The Accounting Framework

Definition 14.1 (Doxonomic Account)**.** A *doxonomic account* for belief p in period $[0, T]$ is a table

$$\mathcal{L}_p = \{(s_k, \iota_k, c_k, F_k, \Theta_k)\}_{k=1}^{m}$$

where s_k is the funding source, ι_k is the processing institution, c_k is the channel, F_k is the expenditure, and Θ_k is the estimated doxonomic throughput. The *total doxonomic investment* in p is $F_p = \sum_k F_k$.

A complete doxonomic account answers five questions:

1. **Who paid?** (source identification)
2. **Who processed?** (institutional intermediation)
3. **What was produced?** (narrative output)
4. **Who was reached?** (audience and exposure)
5. **What was the effect?** (belief change, behavioral consequence)

In practice, complete accounts are rarely achievable. Funding opacity, institutional complexity, and the difficulty of measuring belief effects mean that most doxonomic accounts are partial. Partial accounting is vastly better than no accounting.

Example 14.2 (Partial Account: Climate Doubt). A partial doxonomic account for the belief "climate science is uncertain" in the U.S., 1990–2010 (Oreskes and Conway 2010):

Source	Institution	Channel	$ (est.)	Reach
ExxonMobil	Heartland Inst.	Reports, op-eds	$8M	Policy
Koch Industries	Americans for Prosperity	TV ads, rallies	$50M+	Mass
Coal industry	Global Climate Coalition	Lobbying, PR	$13M	Congress
Multiple	George C. Marshall Inst.	Congressional testimony	$2M	Elite
Multiple	Competitive Enterprise Inst.	Media appearances	$5M	Broadcast

This is a fragment of the total. Oreskes and Conway (2010) and subsequent investigations (Frumhoff et al., 2015; Supran and Oreskes, 2017) have documented hundreds of millions in total spending across dozens of institutions. The account is partial because:

- not all funding is traceable (dark money, donor-advised funds),
- institutional overhead is not separated from narrative production,
- throughput estimates are rough (how many people were actually reached and influenced?),
- the causal link from spending to belief change is not established by the account alone (that requires Chapter 16).

14.2 Source Identification

Tracing funding to belief requires navigating layers of intermediation. A typical chain:

Corporation → Foundation → Donor-advised fund → Think tank → Publication

Each intermediary adds opacity. The corporation may be legally required to disclose its contributions to the foundation, but the foundation may route grants through a donor-advised fund (which does not disclose the ultimate recipient), and the think tank may not disclose its funders.

Definition 14.3 (Funding Chain)**.** A *funding chain* for belief p is a directed path in the financial network:

$$s_0 \xrightarrow{f_1} s_1 \xrightarrow{f_2} \cdots \xrightarrow{f_l} \iota \xrightarrow{\text{produces}} n_p$$

where s_0 is the ultimate source, $s_1, \ldots, s_{l-1}$ are intermediaries, ι is the narrative-producing institution, and f_i is the flow at each stage. The *chain length* l measures the number of intermediation layers. Longer chains are more opaque.

14.2.1 Data Sources for Source Identification

- **IRS Form 990 filings** (U.S.): tax-exempt organizations must file annual returns listing revenues, expenditures, and grants made. Available through ProPublica Nonprofit Explorer and Guidestar. *Limitation*: does not require disclosure of donors to 501(c)(4) organizations; donor-advised funds disclose the fund sponsor but not the donor.
- **Lobbying disclosure records**: the U.S. Lobbying Disclosure Act requires registration of lobbyists and quarterly reports of expenditures. Available through OpenSecrets. *Limitation*: covers only direct lobbying, not grassroots campaigns, astroturfing, or think-tank-mediated advocacy.
- **Corporate annual reports and SEC filings**: publicly traded companies disclose political spending and trade-association memberships. *Limitation*: disclosure requirements vary; many expenditures are classified as "education," "research," or "community engagement" without specifying ideological content.
- **Investigative journalism databases**: ProPublica, InfluenceWatch, LittleSis, SourceWatch. *Limitation*: coverage is selective (focused on controversial or politically salient cases); data quality varies.
- **Academic forensic accounting**: scholars have reconstructed funding networks through painstaking archival work. Mayer (2016) traced Koch network funding; Oreskes and Conway (2010) traced fossil fuel funding of doubt. *Limitation*: labor-intensive, not systematic, not reproducible at scale.

Definition 14.4 (Funding Opacity)**.** The *opacity* of a funding chain is a measure of how difficult it is to trace the chain from narrative output back to ultimate source. We define:

$$\text{Opacity}(\text{chain}) = 1 - \prod_{i=1}^{l} d_i$$

where $d_i \in [0,1]$ is the disclosure probability at intermediary i (the probability that the flow f_i is publicly documented). A fully transparent chain (all $d_i = 1$) has opacity 0. A chain with one perfectly opaque intermediary ($d_i = 0$ for some i) has opacity 1.

Remark 14.5 (The Opacity Arms Race). As doxonomic accounting improves, funders develop more sophisticated opacity mechanisms: pass-through entities, foreign intermediaries, anonymized cryptocurrency transfers, and corporate structures designed to frustrate tracing. Doxonomic accounting is therefore an adversarial exercise: the accounting methodology must evolve in response to evasion strategies, much as tax enforcement evolves in response to tax avoidance.

14.3 Ideological Input-Output Tables

The belief production chain involves institutions that are both producers and consumers of narrative. A think tank produces reports that are consumed by media; media produces coverage that is consumed by politicians; politicians produce policies that are consumed by think tanks as evidence for their next round of reports. This circular flow is captured by the input-output framework.

Model 14.6 (Doxonomic Input-Output Table)**.** Let n institutional sectors produce narrative output. The input-output matrix $\boldsymbol{A}$ has entries $a_{ij} \in [0,1]$ representing the fraction of institution j's narrative output consumed as input by institution i. The total output vector $\boldsymbol{n}$ satisfies

$$\boldsymbol{n} = \boldsymbol{A}\boldsymbol{n} + \boldsymbol{d}$$

where $\boldsymbol{d}$ is the exogenous injection (direct funder input). The solution, when $(\boldsymbol{I} - \boldsymbol{A})$ is invertible and the spectral radius of $\boldsymbol{A}$ is less than 1, is

$$\boldsymbol{n} = (\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{d}$$

The matrix $(\boldsymbol{I}-\boldsymbol{A})^{-1}$ is the *doxonomic multiplier*: it shows how a unit injection of narrative through one sector amplifies through the system.

Example 14.7 (Constructing an Input-Output Table). Consider four sectors: think tanks (T), prestige media (M), broadcast news (B), and education (E). Estimating the inter-sector flows from citation patterns, sourcing data, and content analysis:

To ↓ / From →	T	M	B	E	Exog. $\boldsymbol{d}$
Think tanks T	0	0.05	0.02	0.10	\$50M
Prestige media M	0.30	0	0.10	0.05	\$20M
Broadcast news B	0.15	0.40	0	0.02	\$10M
Education E	0.20	0.10	0.05	0	\$30M

Reading the table: 30% of think-tank output is picked up by prestige media ($a_{MT} = 0.30$); 40% of prestige media output is recycled into broadcast news ($a_{BM} = 0.40$); 20% of think-tank output eventually enters educational materials ($a_{ET} = 0.20$).

The Leontief inverse $(\boldsymbol{I} - \boldsymbol{A})^{-1}$ reveals:

- a \$1M injection into think tanks produces approximately \$1.5M in total narrative output (50% amplification through the system),
- the largest multiplier path is $T \to M \to B$: think-tank research is picked up by prestige media, which is then amplified by broadcast news,
- the education sector is a "slow amplifier": it absorbs think-tank and media output and releases it over decades through curricula.

Remark 14.8 (Estimating the $\boldsymbol{A}$ Matrix). The inter-institutional flow coefficients a_{ij} are not directly observable. They must be estimated from:

- **Citation analysis**: how often does institution i cite or reference institution j's outputs?
- **Sourcing studies**: content analyses of media output identifying the institutional origins of claims, data, and expert quotes.
- **Network analysis**: co-membership, co-citation, and personnel-flow networks that trace idea movement between institutions (Chapter 15).
- **Survey of practitioners**: journalists report which sources they rely on; policymakers report which think-tank outputs influence their thinking.

All methods are imprecise. The input-output table should be accompanied by uncertainty bounds on each coefficient.

14.4 Accounting Identities

Principle 14.9 (Doxonomic Accounting Identity)**.** For each institution ι in steady state:

$$\text{Total funding in} = \text{Narrative output} \times \text{Unit cost} + \text{Institutional overhead}$$

In symbols: $F_\iota = \Theta_\iota \cdot c_{\text{unit}} + O_\iota$. The *doxonomic efficiency* is $\eta_\iota = \Theta_\iota / F_\iota = 1 - O_\iota / F_\iota$.

Doxonomic efficiency varies widely across institution types:

- **High efficiency** ($\eta > 0.6$): small advocacy organizations, online media outlets, social media campaigns. Low overhead, direct narrative output.
- **Medium efficiency** ($\eta \approx 0.3$–0.5): think tanks, PR firms. Moderate overhead (buildings, staff, credibility maintenance), substantial narrative output.
- **Low efficiency** ($\eta < 0.2$): universities, government agencies. High overhead (research infrastructure, administration, teaching, non-doxonomic functions), but the doxonomic output has very high credibility and persistence.

Remark 14.10 (Efficiency vs. Effectiveness). Low doxonomic efficiency does not mean low doxonomic effectiveness. A university with $\eta = 0.1$ spends 90% of its budget on non-doxonomic functions (research, teaching, administration), but the 10% that produces belief effects has $C \approx 0.9$ and $T \approx 30$ years. A social media campaign with $\eta = 0.8$ converts most of its budget to reach, but with $C = 0.15$ and $T = 0.01$ years. The long-run doxonomic impact (throughput $\times$ persistence $\times$ credibility) may be higher for the university despite its lower efficiency. This is why the equimarginal principle (Proposition 4.12) and the IROI calculation (Definition 10.5) account for credibility and persistence, not just efficiency.

14.5 Uncertainty in Doxonomic Accounting

Doxonomic accounts are never precise. Every entry involves estimation, and honest accounting must report the uncertainty.

Definition 14.11 (Account Uncertainty)**.** For each line in a doxonomic account, the uncertainty is characterized by:

- **Source uncertainty**: the ultimate funder may be unknown or partially traced (opacity > 0). Report as a confidence interval: $s_k \in \{\text{known sources}\}$ with probability p_s, or "unknown" with probability $1 - p_s$.
- **Amount uncertainty**: the expenditure F_k is often estimated from partial data (e.g., grant totals that include both doxonomic and non-doxonomic spending). Report as $F_k \in [F_L, F_U]$ with 90% confidence.
- **Throughput uncertainty**: the estimated doxonomic throughput Θ_k depends on reach, credibility, and persistence estimates, each with its own error. Report the propagated uncertainty.
- **Attribution uncertainty**: the fraction of an institution's output attributable to belief p (vs. other beliefs or non-doxonomic functions) is a judgment call. Report the sensitivity of F_p to this attribution fraction.

Principle 14.12 (Honest Accounting)**.** A doxonomic account without uncertainty bounds is not a doxonomic account. It is advocacy with numbers. The field's credibility (its own epistemic capital) depends on honest reporting of what is known, what is estimated, and what is guessed.

14.6 A Worked Example: Accounting for Austerity Belief

To illustrate the full accounting framework, consider a partial account for the belief "government debt is dangerous and austerity is necessary" in the UK, 2009–2013.

Step 1: Source identification. The austerity narrative was promoted by:

- Centre for Policy Studies (CPS): founded by Thatcher and Keith Joseph, annual budget ∼£2M.
- Institute of Economic Affairs (IEA): annual budget ∼£3M.
- Taxpayers' Alliance: annual budget ∼£1M.
- The Treasury itself: the largest single source of austerity framing, but with public rather than private funding.
- Financial press (*Financial Times*, *Economist*): editorial stances aligned with austerity, funded by subscriptions and advertising from the financial sector.

Step 2: Processing. Think tanks produced policy briefs, opinion pieces, and parliamentary testimony. The Treasury produced budget documents, forecasts, and press conferences. Financial media produced daily coverage framing debt as crisis.

Step 3: Throughput estimation.

Source	£/yr	Reach	Credibility	Θ
CPS	£2M	0.01	0.6	12K
IEA	£3M	0.01	0.7	21K
Taxpayers' Alliance	£1M	0.05	0.3	15K
Treasury (austerity share)	£10M est.	0.3	0.8	2.4M
Financial press	£50M est.	0.2	0.7	7M

Step 4: Total. The private think-tank investment was modest (∼£6M/year), but the amplification through the Treasury and financial press produced throughput orders of magnitude larger. The multiplier effect (Model 14.6) was enormous: a small think-tank injection was amplified by the most credible institutions in the system.

Step 5: Uncertainty. The Treasury's "austerity share" is an estimate (what fraction of Treasury communication was devoted to the austerity narrative vs. other policy); the financial press estimate is rough (advertising revenue is not doxonomic spending, but editorial alignment is). The total investment is somewhere in the range £50M–£100M/year, with enormous amplification from institutional credibility.

Remark 14.13. This example illustrates a general pattern: private doxonomic investment is often small relative to the total narrative output, because public institutions and commercial media provide massive amplification. The think tanks do not need to reach the public directly; they need to reach the *institutions* that reach the public. The multiplier, not the direct investment, is the story.

14.7 Accounting for Non-Monetary Flows

Not all doxonomic resources are monetary. Several important flows resist financial accounting:

- **Volunteer labor**: social movements, religious organizations, and community groups produce narrative through unpaid work. The monetary equivalent can be estimated (hours × wage rate), but the institutional dynamics differ from funded production.
- **Attention as currency**: on social media, sharing, liking, and commenting are forms of doxonomic production with zero monetary cost to the producer but significant narrative effect.
- **Institutional cross-subsidy**: a corporation's marketing budget (spent on product advertising) also reinforces the consumer-identity anthropological regime; a military's recruitment budget also reinforces nationalist narratives. These doxonomic effects are by-products, not intentional investments, but they are real.
- **Architecture and space**: the built environment communicates beliefs without any ongoing narrative production (monumental state buildings communicate power; open-plan offices communicate transparency/surveillance; shopping malls communicate consumption-as-activity).

Definition 14.14 (Expanded Doxonomic Account)**.** An *expanded doxonomic account* adds non-monetary flows to the standard account:

$$\mathcal{L}_p^+ = \mathcal{L}_p \cup \{(\text{source}, \text{type}, \text{estimated equivalent}, \Theta)\}_{\text{non-monetary}}$$

The "estimated equivalent" converts non-monetary contributions to dollar values where possible and flags them as imputed rather than observed.

14.8 Notes and References

The accounting approach draws on national income accounting methods (Stiglitz 2012). The Leontief input-output framework originates in Leontief (1941); for a modern introduction, see Miller and Blair (2009). Dark money flows are documented in Mayer (2016). The application of input-output accounting to narrative flows is original to this text. For lobbying data, see OpenSecrets; for think-tank funding, see InfluenceWatch and ProPublica Nonprofit Explorer. On media ownership structures, see Bagdikian (2004).

On the specific case of climate-doubt funding, see Oreskes and Conway (2010) and Supran and Oreskes (2017). For the UK austerity case, see Streeck (2016) and Blyth (2013), *Austerity: The History of a Dangerous Idea*. On non-monetary doxonomic production (architecture, space, material culture), see Latour (2005) and Scott (1998). The opacity concept connects to the literature on dark money and political finance regulation (Mayer 2016).

14.9 Exercises

Exercise 14.1. Using publicly available IRS 990 data (via ProPublica Nonprofit Explorer), construct a partial doxonomic account for the belief "regulation

harms economic growth" by tracing funding from three major foundations to think tanks to publications. Report the funding chain length and opacity for each path.

Exercise 14.2. Compute the Leontief inverse for the four-sector system in Example 14.7. What is the total system-wide narrative output from a \$1M injection into think tanks? Which indirect pathway produces the largest multiplier effect?

Exercise 14.3. Estimate the doxonomic efficiency η of: (a) a university economics department, (b) a social media campaign, (c) a think tank. For each, estimate the total budget, the fraction devoted to doxonomic output, and the resulting η. Which has the highest efficiency? Which has the highest long-run effectiveness? Why might these differ?

Exercise 14.4. Take the austerity worked example (Section 14.6) and construct 90% confidence intervals for each throughput estimate. How does the uncertainty in the "austerity share" of Treasury communication affect the total investment estimate? Perform a sensitivity analysis: report F_p under optimistic, central, and pessimistic attribution assumptions.

Exercise 14.5. Identify three non-monetary doxonomic flows in your daily life (e.g., architectural, spatial, routine, performative). Estimate their doxonomic throughput in dollar-equivalent terms. How do they compare in magnitude to the monetary flows you encounter through media and advertising?

Exercise 14.6. Construct a doxonomic account for a belief of your choice. Report: (a) at least three funding sources with amounts, (b) at least two processing institutions, (c) at least two channels with reach and credibility estimates, (d) total F_p with uncertainty bounds, (e) a candid assessment of what you could not trace and why.

Exercise 14.7. The chapter defines funding opacity as $1 - \prod_i d_i$. For a chain of length $l = 4$ where each intermediary has disclosure probability $d_i = 0.7$, compute the opacity. What opacity would the chain have if a donor-advised fund ($d = 0.1$) were inserted as one intermediary? What does this imply about the doxonomic accounting challenge posed by anonymous philanthropy?

CHAPTER 15

Network Analysis of Belief Systems

> Tell me who your friends are, and I will tell you who you are.
>
> Proverb

Doxonomic systems are networks: funders connect to institutions, institutions connect to media, media connect to audiences, and audiences feed back into funders. The structure of these connections (who is linked to whom, with what weight, through what pathways) determines how narratives flow, where they amplify, and which nodes hold structural power.

This chapter applies graph theory and network science to map and measure doxonomic structures. Where previous chapters treated the belief production chain as a linear sequence, this chapter reveals it as a complex, multiply-connected network with shortcuts, bottlenecks, clusters, and bridges.

15.1 Doxonomic Networks

Definition 15.1 (Doxonomic Network)**.** A *doxonomic network* is a weighted directed graph $G = (V, E, w)$ where:

- vertices V are doxonomic agents (funders, institutions, media, intermediaries, audience segments),
- directed edges E represent influence or resource flows (money, citations, sourcing, audience sharing),
- weights $w : E \to \mathbb{R}_{\geq 0}$ measure the magnitude of the flow (dollars, citation counts, audience share fraction).

A doxonomic network is typically *multipartite*: vertices can be classified into layers (funders → institutions → channels → audiences), with most edges running between layers. But the network is not strictly layered: there are important within-layer connections (institutions cite each other, media outlets share content, funders coordinate) and feedback edges (audience behavior influences funders).

Definition 15.2 (Network Types)**.** Several network projections are useful for different analytical purposes:

Funding network: $G_F = (V_{\text{funders}} \cup V_{\text{institutions}}, E_F)$ where edges represent grant flows. Source: IRS 990 data, foundation annual reports.

Citation network: $G_C = (V_{\text{institutions}} \cup V_{\text{media}}, E_C)$ where edges represent citation or sourcing relationships. Source: content analysis, media sourcing studies.

Personnel network: $G_P = (V, E_P)$ where edges represent personnel movement (a person leaving institution A to join institution B). Source: LinkedIn data, biographical records.

Board interlock: $G_B = (V_{\text{institutions}}, E_B)$ where edges connect institutions sharing board members. Source: organizational filings, databases like BoardEx.

Audience overlap: $G_A = (V_{\text{channels}}, E_A)$ where edges represent shared audience (people who consume both channels). Source: survey data, platform analytics.

Each projection reveals a different aspect of the doxonomic system. The funding network shows who pays for what. The citation network shows how ideas propagate. The personnel network shows how institutional cultures diffuse. The board-interlock network shows structural coordination. The audience-overlap network shows which channels reach the same people.

Remark 15.3 (Multiplex Analysis). In practice, these networks overlap: institution A may be funded by funder X (funding edge), cited by media outlet Y (citation edge), share a board member with institution B (interlock edge), and hire graduates of institution C (personnel edge). The multiplex structure (multiple relationship types between the same nodes) is what makes doxonomic networks so robust: disrupting one type of connection leaves others intact. A funder who withdraws funding may still be connected through board interlocks and personnel sharing.

15.2 Centrality Measures

Not all nodes in a doxonomic network are equally important. Centrality measures identify the nodes that occupy structurally powerful positions.

Definition 15.4 (Doxonomic Centrality)**.** The *doxonomic centrality* of node v is its eigenvector centrality in the weighted network:

$$x_v = \frac{1}{\lambda} \sum_{u:(u,v)\in E} w_{uv} \cdot x_u$$

where λ is the largest eigenvalue of the weighted adjacency matrix. Nodes with high doxonomic centrality are those that receive large weighted inputs from other central nodes, a recursive definition that captures the idea that influence from influential sources is worth more than influence from peripheral ones.

Eigenvector centrality is closely related to PageRank (used by Google to rank web pages) and has a natural doxonomic interpretation: a node is central if it is cited, funded, or sourced by other central nodes. This captures the credibility-laundering dynamic (Example 4.5): an institution becomes credible by being associated with other credible institutions.

Example 15.5 (Centrality Hierarchy). In the U.S. policy-influencing network, typical centrality rankings are:

1. **Highest**: major universities (Harvard, MIT, Stanford, Chicago), central through personnel, citation, and prestige networks simultaneously.
2. **High**: legacy think tanks (Brookings, Heritage, AEI, RAND), central through funding, citation, and congressional testimony networks.
3. **Medium**: prestige media (*NYT*, *WSJ*, *Washington Post*), central through citation and audience networks.
4. **Lower**: newer think tanks, advocacy organizations, connected through fewer network layers.
5. **Peripheral**: grassroots organizations, independent media, weakly connected to the core.

The centrality hierarchy is remarkably stable over time: the top-ranked institutions in 2020 were substantially the same as in 1990, reflecting the path dependence of epistemic capital accumulation (Proposition 6.10).

15.2.1 Multiple Centrality Measures

Different centrality measures capture different forms of structural importance:

Measure	What it captures	Doxonomic interpretation
Eigenvector	Connected to well-connected nodes	Prestige through association
Betweenness	Lies on many shortest paths	Brokerage power
In-degree	Many incoming edges	Attention/funding recipient
Out-degree	Many outgoing edges	Narrative producer/distributor
Closeness	Short distance to all others	Speed of narrative propagation
PageRank	Important in directed flow	Influence in directed networks

A node may rank high on one measure and low on another. A think tank may have high betweenness (it bridges funders and media) but low in-degree (it has few funders). A social media platform may have enormous out-degree (it reaches billions) but low eigenvector centrality (it is not prestigious). The appropriate centrality measure depends on the doxonomic question being asked.

15.3 Community Detection

Definition 15.6 (Narrative Cluster)**.** A *narrative cluster* is a community in the doxonomic network: a subset $S \subset V$ with denser internal connections than external ones. Formally, S maximizes the modularity:

$$Q = \frac{1}{2W} \sum_{i,j \in S} \left(w_{ij} - \frac{s_i s_j}{2W} \right)$$

where $s_i = \sum_j w_{ij}$ is the weighted degree of node i and $W = \frac{1}{2} \sum_{ij} w_{ij}$ is the total weight. High modularity ($Q > 0.3$) indicates well-separated clusters.

Narrative clusters reveal which institutions form coherent ideological coalitions, even without explicit coordination. Institutions within the same cluster share funders, cite each other's work, hire each other's personnel, and tend to produce narratives within a similar ideological range. The cluster structure emerges from *structural alignment* (Principle 9.6), not from conspiracy.

Example 15.7 (Two-Cluster Structure in U.S. Policy)*.* Benkler et al. (2018) mapped the U.S. media and think-tank ecosystem during the 2016 election and found a striking asymmetric structure:

- A **right-wing cluster** centered on Breitbart, Fox News, and talk radio, with dense internal citation but sparse links to other media. This cluster shared a distinct funding network (Mercer family, Koch network), a distinct personnel pool, and a distinct audience.
- A **center-to-left cluster** with the *New York Times* at its center, connected to a broader range of outlets including *Washington Post*, CNN,

BBC, and academic institutions. This cluster had higher internal citation diversity and more external connections.

The asymmetry is doxonomically significant: the right-wing cluster is more insular (higher intra-cluster density, lower inter-cluster connections), which means it can sustain narratives that diverge from the center cluster without corrective pressure from shared sources. This is the network-structural basis of epistemic fragmentation (Definition 12.14).

15.4 Brokerage

Definition 15.8 (Epistemic Broker)**.** An *epistemic broker* is a node v with high betweenness centrality:

$$g(v) = \sum_{s \neq v \neq t} \frac{\sigma_{st}(v)}{\sigma_{st}}$$

where σ_{st} is the number of shortest paths from s to t and $\sigma_{st}(v)$ is the number passing through v. Brokers bridge otherwise disconnected narrative clusters and can translate ideas between communities.

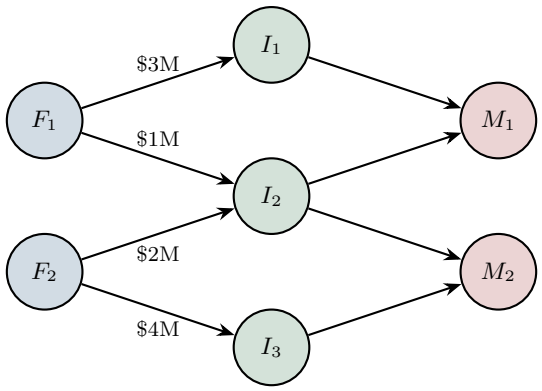
Brokers occupy a special doxonomic position: they have access to multiple narrative worlds and can control the flow of ideas between them. A journalist who covers both conservative think tanks and progressive policy organizations is an epistemic broker. An academic who publishes in both economics journals and sociology journals bridges disciplinary clusters.

Proposition 15.9 (Broker Power)**.** *Epistemic brokers derive power from three sources:*

1. ***Translation**: they can reframe ideas from one cluster in the language of another, making them legible and credible across boundaries.*
2. ***Gatekeeping**: they control which ideas cross cluster boundaries and which are blocked.*
3. ***Arbitrage**: they can exploit information asymmetries between clusters, introducing ideas that are common knowledge in one cluster as "new insights" in another.*

Example 15.10 (Brokerage in the Neoliberal Network). Milton Friedman functioned as an epistemic broker between academic economics, public media, and political policy. He translated technical economic arguments into popular columns (*Newsweek*), television programs (*Free to Choose*), and policy advice (to Pinochet, Reagan, Thatcher). His brokerage position (connecting the academic cluster to the media cluster to the political cluster) was arguably more consequential than his academic contributions alone, because it enabled ideas that were contentious within economics to become common sense in policy.

15.5 Example: A Donor-Institution Network



In this network, institution I_2 is the epistemic broker: it bridges both funders and both media outlets. It receives funding from both F_1 and F_2 and feeds into both M_1 and M_2. Its betweenness centrality is the highest in the network: removing I_2 would disconnect F_1 from M_2 and F_2 from M_1.

Remark 15.11 (Interpreting the Diagram). Several doxonomic insights emerge from even this simple network:

- F_2 has more total funding (\$6M) but F_1's funding reaches a higher-credibility media outlet (M_1) through the more efficient pathway $F_1 \to I_1 \to M_1$.
- I_2 is the most structurally powerful institution despite receiving less funding than I_3, because of its bridging position.
- If I_2 is captured by one funder (say F_2 doubles its grant while F_1 withdraws), the narrative output of M_1 shifts, even though M_1 receives no direct funding from F_2. This is *indirect influence*: controlling the broker controls the bridge.

15.6 Spectral Analysis of Doxonomic Networks

The eigenvalue spectrum of a doxonomic network reveals its structural properties.

Definition 15.12 (Narrative Propagation Speed)**.** The *narrative propagation speed* in a network is determined by the spectral radius λ_1 of the weighted adjacency matrix $\boldsymbol{W}$:

$$\lambda_1 = \max\{|\lambda| : \det(\boldsymbol{W} - \lambda \boldsymbol{I}) = 0\}$$

Higher λ_1 means faster propagation: narratives injected at any node reach the entire network more quickly. The spectral gap $\lambda_1 - \lambda_2$ (difference between the two largest eigenvalues) measures the mixing rate: a large gap means the network converges to a steady-state narrative distribution quickly, while a

small gap means distinct clusters can maintain different narratives for extended periods.

Proposition 15.13 (Spectral Gap and Fragmentation)**.** *If the spectral gap $\lambda_1 - \lambda_2$ is small (near zero), the network is close to disconnected: it contains clusters that communicate weakly. In doxonomic terms, a small spectral gap predicts epistemic fragmentation (Definition 12.14): the network can sustain divergent belief systems in different clusters. A large spectral gap predicts narrative convergence: information flows rapidly enough across the network that maintaining divergent narratives is difficult.*

Remark 15.14. The spectral gap provides a structural prediction: systems with small spectral gaps are vulnerable to polarization, while systems with large spectral gaps are vulnerable to common-sense capture. Both are doxonomic risks; the question is which one a given society faces. Public broadcasting, shared curricula, and cross-community institutions increase the spectral gap (by adding cross-cluster edges), making polarization harder but capture easier. This is a structural version of the coherence-fragmentation tradeoff (Chapter 12).

15.7 Temporal Network Dynamics

Doxonomic networks are not static. They evolve as institutions are founded or dissolved, as funding flows shift, as personnel move, and as new media channels emerge.

Definition 15.15 (Network Evolution)**.** A *temporal doxonomic network* is a sequence $\{G_t\}_{t=0}^{T}$ of networks on a (possibly changing) vertex set V_t with time-varying edges E_t and weights w_t. Key events include:

- **Node entry**: a new institution is founded (Heritage Foundation, 1973; Fox News, 1996; Breitbart, 2007).
- **Node exit**: an institution closes or loses relevance.
- **Edge rewiring**: funding flows shift (a foundation redirects grants from one think tank to another).
- **Weight changes**: an existing connection strengthens or weakens (a newspaper increases its reliance on a particular think tank as a source).

Example 15.16 (Network Evolution: Conservative Infrastructure 1970–2020).

- **1970**: sparse network with a few academic nodes (Chicago, Virginia), the Mont Pèlerin Society, and limited institutional infrastructure.
- **1980**: new nodes added (Heritage, Cato, AEI expansion, Olin-funded law-and-economics programs), dense funding edges from Olin/Scaife/Bradley/Koch.
- **1996**: Fox News enters as a high-reach amplifier node, dramatically increasing the spectral radius and connecting the policy cluster to a mass audience.

- **2007–2015**: digital nodes (Breitbart, Daily Wire, PragerU, Turning Point USA) add a new layer with very high reach but lower credibility, creating the two-tier structure described in Model 6.18.
- **2020**: the network is far denser, has higher total throughput, but also shows internal fragmentation (establishment conservative cluster vs. populist cluster, with weakening cross-cluster edges).

Tracking this evolution requires longitudinal data: 990 filings over decades, citation analyses across multiple time periods, personnel movement records, and audience-overlap surveys.

15.8 Network Resilience and Attack Vulnerability

Definition 15.17 (Network Resilience)**.** A doxonomic network is *resilient* if the removal of a small number of nodes does not significantly reduce the maximum pathway efficiency (Definition 7.8) or increase epistemic fragmentation.

Proposition 15.18 (Scale-Free Vulnerability)**.** *If a doxonomic network is scale-free (a small number of hubs have most connections, as is typical for citation and media networks), it is:*

- ***robust** to random node removal (removing random institutions has little effect, because most nodes are peripheral),*
- ***vulnerable** to targeted attack on hubs (removing the few most-connected nodes rapidly fragments the network).*

This has implications for both counter-doxonomic strategy and doxonomic defense. Counter-doxonomic actors should target hubs (high-centrality institutions whose removal would fragment the narrative pipeline). Doxonomic actors should diversify their networks to reduce hub dependency.

Example 15.19 (Targeted vs. Random Disruption). Suppose a doxonomic network has 50 institutions, with 3 hubs (a major think tank, a prestige newspaper, a dominant broadcaster) accounting for 60% of total throughput.

- **Random removal** of 3 institutions: expected throughput reduction $\sim 6\%$ (most removed nodes are peripheral).
- **Targeted removal** of the 3 hubs: throughput reduction $\sim 60\%$, plus the network fragments into disconnected components.

The ten-fold difference in effect illustrates scale-free vulnerability. In practice, "removing" an institution means discrediting it (credibility attack, Chapter 6), cutting its funding, or undermining its gatekeeper position, not literal elimination.

15.9 Practical Network Reconstruction

Constructing a doxonomic network from empirical data is a substantial research task. The practical steps are:

1. **Define the boundary**: which institutions, funders, and channels are included? (The boundary choice is an analytical decision that affects all results.)
2. **Identify nodes**: list all relevant actors from funding databases, media directories, and institutional registries.
3. **Identify edges**: for each node pair, check for funding relationships (990 data), citation relationships (content analysis), personnel movement (biographical data), and board interlocks (organizational filings).
4. **Estimate weights**: assign weights based on dollar flows, citation counts, audience share, or a composite measure.
5. **Validate**: check the reconstructed network against known case studies. If a well-documented funding relationship is missing from the network, the reconstruction is incomplete.
6. **Compute metrics**: centrality, modularity, spectral gap, vulnerability indices.
7. **Report uncertainty**: edges may be missing (opacity), weights may be estimated, and the boundary choice affects results. Sensitivity analysis is essential.

15.10 Notes and References

Network analysis draws on Jackson (2008) for economic and social networks. Community detection via modularity is due to Newman (2006); for a review of community detection methods, see Fortunato (2010). Betweenness centrality is from Freeman (1977). Eigenvector centrality and PageRank are related; for the connection, see Langville and Meyer (2006). For applications to media and political networks, see Watts (2002) and Benkler et al. (2018). Donor networks in U.S. politics are mapped in Mayer (2016) and Phillips-Fein (2009).

Scale-free network vulnerability is analyzed in Albert, Jeong, and Barabási (2000). Spectral graph theory is covered in Chung (1997). Multiplex networks are treated in Kivelä et al. (2014). Board interlocks as a form of elite coordination are studied in Mizruchi (1996). For temporal network analysis, see Holme and Saramäki (2012).

15.11 Exercises

Exercise 15.1. Compute the eigenvector centrality of each node in the example network (Section 15.5). Which node has the highest doxonomic centrality? Does the centrality ranking change if you use betweenness centrality instead?

Exercise 15.2. Using citation data from a policy domain of your choice, construct a donor-institution-media network with at least 10 nodes. Identify narrative clusters using modularity maximization. Who are the epistemic brokers?

Exercise 15.3. Prove that removing a node v from a connected graph G increases the number of connected components if and only if v is a *cut vertex* (its removal disconnects G). Is every node with high betweenness centrality a cut vertex?

Exercise 15.4. For the four-sector input-output system in Example 14.7, compute the spectral radius λ_1 and the spectral gap $\lambda_1 - \lambda_2$. Predict whether the system is more vulnerable to fragmentation or to common-sense capture.

Exercise 15.5. Sketch the temporal evolution of a doxonomic network in a domain you know well (e.g., education policy, climate discourse, tech regulation). Identify at least three key events that changed the network structure. How did each event affect centrality rankings and cluster structure?

Exercise 15.6. For a network with 20 nodes where 3 hubs account for 50% of throughput, compute: (a) the expected throughput reduction from removing 3 random nodes, (b) the throughput reduction from removing the 3 hubs. Propose a "doxonomic antifragility" strategy that reduces hub dependency.

Exercise 15.7. The chapter identifies five network projections (funding, citation, personnel, board interlock, audience overlap). For a specific institution of your choice, describe its position in each projection. In which projection is it most central? In which is it most peripheral? What does the difference tell you about its doxonomic role?

Exercise 15.8. Milton Friedman is described as an epistemic broker connecting academic, media, and political clusters. Identify a contemporary equivalent: a person or institution that bridges two or more doxonomic clusters. Map their connections. What would happen to narrative flow between the clusters if the broker were removed?

CHAPTER 16

Causal Inference in Doxonomics

> Correlation is not causation, but it sure is a hint.
>
> Edward Tufte

Doxonomics makes causal claims: funding *causes* belief shift, institutions *produce* narratives, exposure *changes* behavior. These claims require rigorous causal methods, yet the doxonomic setting presents distinctive challenges that standard econometric toolkits do not fully address. Beliefs are partially observable, treatments are continuous and multi-dimensional, interference between units is the norm rather than the exception, and the actors who generate the "treatment" have strategic reasons to obscure the causal chain. This chapter adapts the modern causal inference toolkit (potential outcomes, difference-in-differences, instrumental variables, causal graphs, synthetic controls, and regression discontinuity) to these distinctive challenges.

We proceed from a methodological conviction: doxonomics cannot content itself with establishing that correlations exist between funding flows and belief distributions. The field must identify *mechanisms* and estimate *magnitudes*. Without credible causal identification, doxonomic claims reduce to conspiracy theory dressed in Greek notation.

16.1 The Potential Outcomes Framework

16.1.1 Basic setup

Definition 16.1 (Doxonomic Treatment Effect)**.** Let $Y_j(1)$ be agent j's belief state under exposure to narrative treatment and $Y_j(0)$ under control. The

individual doxonomic treatment effect (IDTE) is

$$\tau_j = Y_j(1) - Y_j(0).$$

The *average doxonomic treatment effect* (ADTE) is

$$\text{ADTE} = \mathbb{E}[Y_j(1) - Y_j(0)].$$

The fundamental problem of causal inference: we observe either $Y_j(1)$ or $Y_j(0)$, never both (Rubin 2005).

The notation is deceptively simple. In practice, three features of doxonomic settings complicate the standard Rubin framework.

1. **Multi-valued, continuous treatment.** Narrative exposure is not binary but varies in intensity, frequency, source credibility, and framing. Let $D_j \in [0, \infty)$ represent a dose of exposure. We need dose-response functions:
$$Y_j(d) = g(d, X_j, U_j)$$
where X_j are observed covariates and U_j unobserved heterogeneity. The average dose-response function is $\mu(d) = \mathbb{E}[Y_j(d)]$, and the marginal effect at dose d is $\mu'(d)$.

2. **Multi-dimensional belief outcomes.** A single narrative intervention may shift beliefs along multiple dimensions simultaneously. If $\mathbf{Y}_j(d) \in \mathbb{R}^k$ is a vector of k belief dimensions, the treatment effect becomes a vector $\boldsymbol{\tau}_j = \mathbf{Y}_j(1) - \mathbf{Y}_j(0)$, raising multiple-testing issues and requiring that researchers specify which dimension is primary ex ante.

3. **Interference.** The Stable Unit Treatment Value Assumption (SUTVA) requires that j's outcome depends only on j's own treatment. In doxonomic settings, agent j's belief depends on the beliefs (and hence treatments) of j's social contacts. Formally, $Y_j = Y_j(D_j, \mathbf{D}_{-j})$, where $\mathbf{D}_{-j}$ includes others' exposures. We address interference below in Section 16.8.

16.1.2 Conditional treatment effects

The ADTE masks important heterogeneity. In doxonomic settings, treatment effects are likely to differ systematically across groups.

Definition 16.2 (Conditional Average Doxonomic Treatment Effect)**.** For a subgroup defined by covariates $X = x$:

$$\text{CADTE}(x) = \mathbb{E}[Y_j(1) - Y_j(0) \mid X_j = x].$$

Of particular interest in doxonomics:

- *Prior-belief heterogeneity*: do those with strong prior beliefs respond differently than the uncommitted?
- *Educational heterogeneity*: does the effect differ by formal education level?
- *Source-trust heterogeneity*: does the treatment effect depend on whether the subject trusts the source institution?

A key doxonomic hypothesis is that treatment effects are *non-monotone* in prior belief: agents with moderate prior beliefs are most susceptible, while those at the extremes resist new information (cf. the Bayesian updating results in Chapter 11). This generates a U-shaped resistance function that causal methods must be able to detect.

16.1.3 Worked example: estimating a think-tank effect

Example 16.3. A think tank begins publishing policy briefs targeting state legislators. We model the treatment as binary: $D_j = 1$ if legislator j receives the briefs, $D_j = 0$ otherwise. The outcome Y_j is the legislator's roll-call voting score on the policy domain the briefs address (e.g., deregulation), measured on a 0–100 scale.

If assignment were random, identification would be trivial:

$$\widehat{\text{ADTE}} = \bar{Y}_{\text{treated}} - \bar{Y}_{\text{control}} = 62.3 - 54.7 = 7.6 \text{ points}.$$

But assignment is not random: the think tank targets swing-district legislators. Selection bias means $\mathbb{E}[Y_j(0) \mid D_j = 1] \neq \mathbb{E}[Y_j(0) \mid D_j = 0]$: swing legislators may differ from safe-seat legislators in baseline ideology. The naive estimator confounds the treatment effect with selection.

We need one of the identification strategies developed below.

16.2 Natural Experiments in Doxonomic Settings

Natural experiments arise when narrative exposure varies for reasons unrelated to individual characteristics, what Angrist and Pischke (2009) call "instruments of fate." The doxonomic setting offers several distinctive sources of quasi-random variation.

16.2.1 Media market boundaries

Following Gentzkow and Shapiro (2010), adjacent counties on opposite sides of a media market boundary receive different television content despite sharing demographic and economic characteristics. If county A receives Fox News at channel position 2 and county B receives it at channel position 73, channel position creates quasi-random variation in exposure.

Model 16.4 (Media Boundary Design)**.** For counties c near boundary b:

$$Y_c = \alpha + \tau D_c + f(\text{dist}_c) + \gamma X_c + \varepsilon_c$$

where D_c is exposure, dist_c is distance to the boundary, $f(\cdot)$ is a smooth function (typically linear or polynomial), and X_c are county-level covariates. The identifying assumption is that unobserved determinants of Y vary smoothly across the boundary, a form of regression discontinuity in geographic space.

16.2.2 Outlet entry and exit

The introduction or removal of a media outlet provides a before/after comparison. Historical examples include:

- the rollout of television across US counties in the 1940s–50s,
- the entry of Fox News into cable markets in the late 1990s (DellaVigna and Kaplan 2007),
- the shutdown of local newspapers ("news deserts") and subsequent shifts in political knowledge and participation,
- the introduction of broadband internet, which shifted the information mix from broadcast to on-demand.

16.2.3 Platform algorithm changes

When a social media platform changes its content recommendation algorithm, the resulting shift in exposure is exogenous to any individual user's characteristics. These events create a useful before/after contrast, though identification requires that no other changes occurred simultaneously, a condition that platform companies rarely guarantee.

16.2.4 Policy shocks

Regulatory changes that affect narrative production or distribution provide natural experiments:

- the repeal of the Fairness Doctrine (1987) and subsequent growth of partisan talk radio,
- foreign-ownership restrictions on media,
- campaign finance rulings (e.g., *Citizens United*) that alter the volume of political advertising,
- educational curriculum mandates that change what students encounter in schools.

Each provides variation in the "supply side" of the doxonomic system that is plausibly independent of individual-level belief determinants.

16.3 Difference-in-Differences

16.3.1 Basic design

Model 16.5 (Doxonomic DiD)**.** Let a new think tank begin operating in region A but not in region B at time t_0. The doxonomic effect is estimated as:

$$\hat{\tau} = (\bar{Y}_{A,\text{post}} - \bar{Y}_{A,\text{pre}}) - (\bar{Y}_{B,\text{post}} - \bar{Y}_{B,\text{pre}})$$

under the parallel trends assumption: absent treatment, beliefs in A and B would have evolved identically.

In regression form:

$$Y_{it} = \alpha + \beta \cdot \text{Treat}_i + \gamma \cdot \text{Post}_t + \tau(\text{Treat}_i \times \text{Post}_t) + \varepsilon_{it}$$

where $\text{Treat}_i = 1$ for units in the treated group, $\text{Post}_t = 1$ for post-treatment periods, and τ is the DiD estimate of the ADTE.

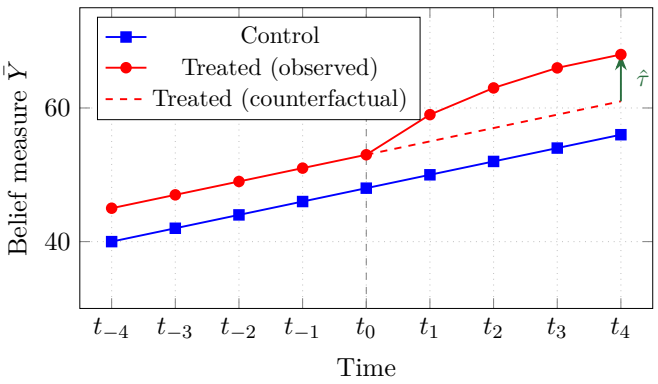
16.3.2 Parallel trends and pre-treatment tests

The parallel trends assumption is untestable: it concerns the counterfactual path of the treated group. However, we can probe its plausibility by examining whether treated and control groups followed parallel trajectories *before* treatment.

Proposition 16.6 (Pre-Trend Test)**.** *If pre-treatment outcomes satisfy*

$$\mathbb{E}[Y_{it} - Y_{it-1} \mid \mathit{Treat}_i = 1] = \mathbb{E}[Y_{it} - Y_{it-1} \mid \mathit{Treat}_i = 0] \quad \textit{for all } t < t_0,$$

this is consistent with (but does not prove) parallel trends. Rejection provides evidence against the identifying assumption.



16.3.3 Staggered adoption and modern DiD

In many doxonomic settings, treatment rolls out at different times across units: a think-tank network opens regional offices sequentially, or a media platform enters different markets over several years. Classical two-way fixed effects (TWFE) regression can produce biased estimates under staggered treatment timing because early-treated units serve as "controls" for later-treated units.

Recent methodological advances address this problem. Following Callaway and Sant'Anna (2021), define the *group-time average treatment effect*:

$$\mathrm{ATT}(g,t) = \mathbb{E}[Y_t(g) - Y_t(\infty) \mid G_i = g]$$

where $G_i = g$ denotes units first treated at time g, $Y_t(g)$ is the potential outcome under treatment beginning at g, and $Y_t(\infty)$ is the never-treated potential outcome. These group-time effects can be aggregated into an overall summary:

$$\hat{\tau}^{\mathrm{agg}} = \sum_{g} \sum_{t \geq g} w_{g,t} \cdot \widehat{\mathrm{ATT}}(g,t)$$

with weights $w_{g,t}$ proportional to group size.

16.3.4 Worked example: think-tank regional entry

Example 16.7. The Prosperity Institute opens offices in three states at staggered intervals: Ohio in 2015, Michigan in 2017, and Pennsylvania in 2019. Using survey data on beliefs about economic regulation from 2012–2022, we estimate group-time ATTs:

	Ohio ($g = 2015$)	Michigan ($g = 2017$)	Pennsylvania ($g = 2019$)
1 year post	+3.2 (1.4)	+2.8 (1.6)	+4.1 (1.8)
2 years post	+5.1 (1.7)	+4.4 (1.9)	+5.8 (2.3)
3 years post	+6.3 (2.0)	+5.9 (2.2)	–

Standard errors in parentheses, clustered by state. The aggregated ATT across all groups and post-periods is $\hat{\tau}^{\mathrm{agg}} = 4.6$ (SE $= 1.1$), suggesting the think tank shifted beliefs about economic regulation by roughly 4.6 points on a 100-point scale. Effects appear to grow over time, consistent with cumulative exposure models from Chapter 11.

Note: This example uses simulated data for illustration. Real applications require actual survey instruments, pre-registration, and sensitivity analyses.

16.4 Instrumental Variables

16.4.1 The doxonomic endogeneity problem

In most doxonomic settings, exposure to narratives is endogenous: people select into media, educational, and social environments based on pre-existing beliefs. This *selective exposure* means that naive regression of belief on exposure confounds the causal effect with self-selection.

Definition 16.8 (Doxonomic Instrument)**.** An *instrument* Z for doxonomic exposure D is a variable that satisfies:

1. **Relevance**: $\mathrm{Cov}(Z, D) \neq 0$, meaning the instrument predicts exposure.
2. **Exclusion**: Z affects belief Y only through exposure D, with no direct effect.
3. **Independence**: $Z \perp\!\!\!\perp U$, meaning the instrument is uncorrelated with unobserved confounders.

Under these conditions, the IV estimator identifies the Local Average Treatment Effect (LATE):

$$\tau^{\mathrm{LATE}} = \frac{\mathrm{Cov}(Y, Z)}{\mathrm{Cov}(D, Z)} = \frac{\text{reduced form}}{\text{first stage}}$$

which is the average treatment effect among *compliers*, agents whose exposure is changed by the instrument.

16.4.2 Candidate instruments

Finding valid instruments is the central challenge of IV estimation. In doxonomic research, several categories of instruments have been proposed or used:

1. **Geographic instruments.** Distance to a university (affects exposure to academic narratives), distance to a think-tank office, proximity to media production centers. The concern: geography correlates with urbanization, education, and wealth, creating potential violations of independence.

2. **Technological instruments.** Cable channel position (lower channel numbers get more viewers), internet connection speed (affects online news consumption), television signal strength. These are often more credible because the assignment mechanism is more clearly exogenous.

3. **Regulatory instruments.** Changes in media ownership rules, campaign finance limits, or educational mandates that shift exposure. These affect the supply side of the doxonomic system in ways plausibly independent of individual demand.

4. **Weather and timing instruments.** Rain on election day (affects turnout and hence exposure to campaign messaging at polling places),

natural disasters that preempt regular media programming, scheduling of major sporting events that shift audience attention.

16.4.3 Two-stage least squares

The practical workhorse for IV estimation is two-stage least squares (2SLS):

First stage:

$$D_j = \pi_0 + \pi_1 Z_j + \pi_2 X_j + v_j$$

Second stage:

$$Y_j = \beta_0 + \tau \hat{D}_j + \beta_1 X_j + \varepsilon_j$$

where $\hat{D}_j$ is the fitted value from the first stage. The coefficient τ is the 2SLS estimate of the causal effect.

A critical diagnostic is first-stage strength. The rule of thumb is that the first-stage F-statistic should exceed 10 (Staiger and Stock 1997). In doxonomic applications, weak instruments are a persistent concern because most plausible instruments have only modest effects on narrative exposure.

16.4.4 Worked example: channel position instrument

Example 16.9. We instrument Fox News viewership with channel position, following DellaVigna and Kaplan (2007). In cable systems, channels assigned to lower positions receive more viewers due to habitual channel-surfing patterns. Channel position is determined by negotiations between cable providers and networks, plausibly independent of local political preferences.

First stage: regress Fox News viewership share on channel position (controlling for demographics):

$$\text{FoxShare}_c = 0.23 - 0.0018 \cdot \text{Position}_c + \gamma X_c + v_c$$

Each 10-position increase reduces Fox viewership by 1.8 percentage points. First-stage $F = 23.4 > 10$.

Second stage: regress Republican vote share on instrumented Fox viewership:

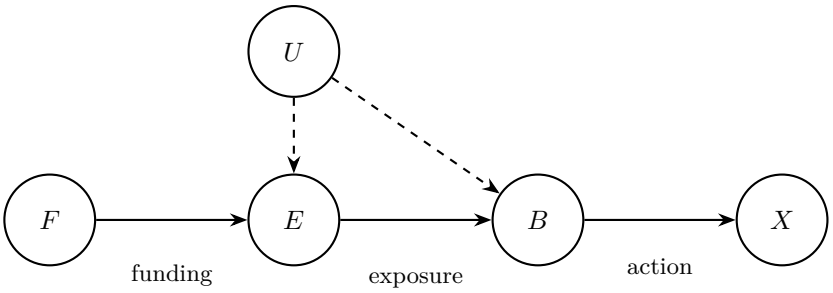
$$\text{RepVote}_c = \alpha + \hat{\tau} \cdot \widehat{\text{FoxShare}}_c + \beta X_c + \varepsilon_c$$

The 2SLS estimate $\hat{\tau} = 0.28$ (SE $= 0.12$): each percentage point of Fox viewership causes a 0.28 percentage point increase in Republican vote share. This is larger than the OLS estimate of 0.15, suggesting that OLS is attenuated by measurement error in viewership (or that compliers are more responsive than the average viewer).

16.5 Causal Directed Acyclic Graphs

16.5.1 The core doxonomic DAG

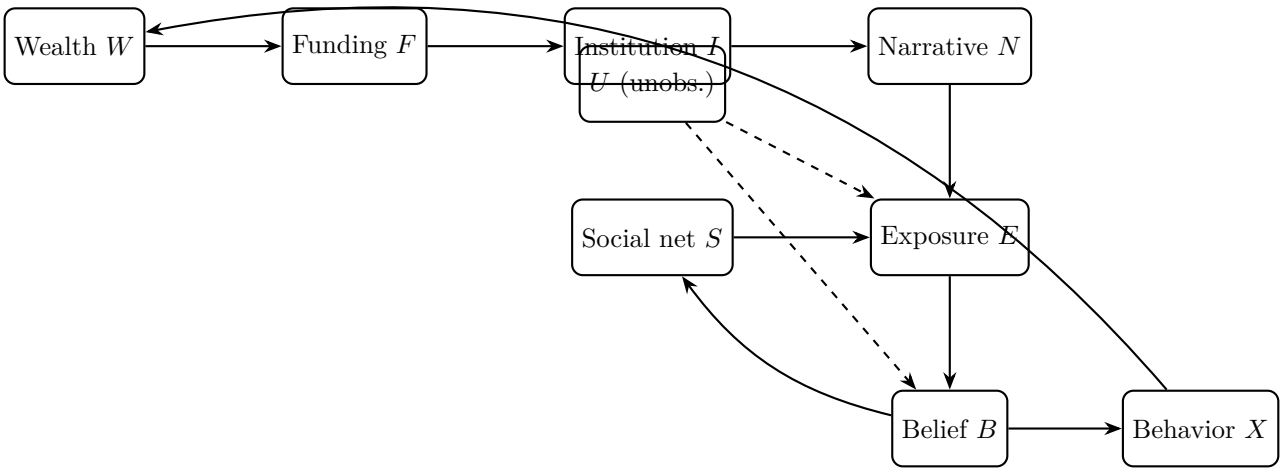
Causal DAGs make identification assumptions transparent by encoding them as graphical structures (Pearl 2009). The core doxonomic DAG links funding, exposure, belief, and behavior:



Here F is funding, E is exposure, B is belief, X is behavior, and U represents unobserved confounders (e.g., pre-existing ideology that affects both media choice and beliefs). The confounding path $E \leftarrow U \rightarrow B$ means naive regression of B on E is biased. An instrument that affects E but not U identifies the causal effect (Pearl 2009; Angrist and Pischke 2009).

16.5.2 An expanded DAG

The core DAG is too simple for most real doxonomic settings. An expanded version includes institutional structure, social influence, and feedback loops:



Two feedback loops appear: $B \to S$ (beliefs shape social networks through homophily) and $X \to W$ (behavior affects wealth, which funds future narrative production). These feedback loops mean the system is not a DAG in the strict sense. It is a *dynamic causal model* that unfolds over time. We recover a DAG by indexing variables by time period: B_t can cause S_{t+1} but not S_t.

16.5.3 Identification via d-separation

Pearl's d-separation criterion determines which causal effects are identifiable from observational data.

Proposition 16.10 (D-Separation for Doxonomic Effects)**.** *In the expanded doxonomic DAG, the causal effect of F on B is identifiable by conditioning on $\{U, S\}$. Since U is unobserved, we need either:*

1. *an instrument for F (affecting F but not U or S directly), or*
2. *a proxy for U that satisfies the conditions of proxy variable estimation, or*
3. *a design that eliminates U (e.g., panel data with individual fixed effects, if U is time-invariant).*

The DAG framework clarifies why doxonomic causal inference is hard: the chain $W \to F \to I \to N \to E \to B$ has many links, and confounders can enter at each one. But it also clarifies the *modularity* of the problem: if we can credibly identify $E \to B$ (the exposure-to-belief link), we can combine it with descriptive evidence on $F \to I \to N \to E$ (the production chain) to construct a complete causal narrative, even if the full chain is not identified in a single study.

16.6 Synthetic Control Methods

16.6.1 The setup

When only one or a few units are treated, difference-in-differences lacks statistical power. Synthetic control methods (Abadie et al. 2010) construct a weighted combination of untreated units that closely matches the treated unit's pre-treatment trajectory.

Definition 16.11 (Synthetic Control Estimator)**.** Let unit 1 be treated at time T_0. The synthetic control is a weighted average of J donor units:

$$\hat{Y}_{1t}^{(0)} = \sum_{j=2}^{J+1} w_j^* Y_{jt}, \quad t > T_0$$

where the weights $\mathbf{w}^* = (w_2^*, \ldots, w_{J+1}^*)$ minimize the pre-treatment discrepancy:

$$\mathbf{w}^* = \arg\min_{\mathbf{w}} \sum_{t=1}^{T_0} \left(Y_{1t} - \sum_{j=2}^{J+1} w_j Y_{jt} \right)^2 \quad \text{s.t. } w_j \geq 0,\ \sum_j w_j = 1.$$

The treatment effect estimate is $\hat{\tau}_{1t} = Y_{1t} - \hat{Y}_{1t}^{(0)}$ for $t > T_0$.

16.6.2 Doxonomic applications

Synthetic control is well-suited to studying country-level or state-level doxonomic interventions where the number of treated units is small:

- the doxonomic effect of a country banning political advertising (treated: Norway; donors: other Nordic/European countries),
- the effect of a media mogul acquiring a national newspaper (treated: the newspaper's audience region; donors: comparable regions),
- the effect of a new educational curriculum on long-run beliefs (treated: the adopting state; donors: non-adopting states).

Inference relies on *placebo tests*: applying the synthetic control procedure to each donor unit in turn and checking whether the treated unit's gap exceeds the placebo distribution. If the treated unit's post-treatment gap is larger than all or nearly all placebo gaps, the effect is deemed significant.

16.6.3 Worked example: advertising ban

Example 16.12. Country A bans political television advertising in 2010. We construct a synthetic version of A from a donor pool of 15 comparable democracies, matching on pre-2010 values of: trust in government, media consumption patterns, GDP per capita, internet penetration, and education levels.

The synthetic A is: $0.31\times$Country B$+0.24\times$Country C$+0.22\times$Country D$+0.23\times$Country E. Pre-treatment fit: root mean squared prediction error $= 1.3$ on a 100-point trust scale.

Post-ban, actual trust in government in A exceeds synthetic A by 4.2 points on average over 2011–2018. Placebo tests show that A's gap ranks 1st out of 16 (all countries), yielding a placebo p-value of $1/16 = 0.0625$, suggestive but not conventionally significant. This illustrates a common limitation: with few donor units, synthetic control has limited statistical power.

16.7 Regression Discontinuity

16.7.1 Sharp and fuzzy designs

Regression discontinuity (RD) exploits a threshold rule that creates a jump in treatment probability at a cutoff value of a running variable.

Definition 16.13 (Doxonomic RD Design)**.** Let R_j be a running variable with cutoff c. In a *sharp* design, treatment is deterministic:

$$D_j = \mathbf{1}(R_j \geq c).$$

In a *fuzzy* design, the probability of treatment jumps at c:

$$\lim_{r \downarrow c} P(D = 1 \mid R = r) - \lim_{r \uparrow c} P(D = 1 \mid R = r) > 0.$$

The RD estimator is

$$\hat{\tau}_{\text{RD}} = \lim_{r \downarrow c} \mathbb{E}[Y \mid R = r] - \lim_{r \uparrow c} \mathbb{E}[Y \mid R = r]$$

for the sharp case, and $\hat{\tau}_{\text{fuzzy}} = \hat{\tau}_{\text{RD}} / \hat{\Delta}_D$ for the fuzzy case, where $\hat{\Delta}_D$ is the first-stage jump in treatment.

16.7.2 Doxonomic RD settings

Several doxonomic settings feature natural thresholds:

1. **Electoral thresholds**: parties that barely win elections gain control of government communications infrastructure; parties that barely lose do not. Comparing beliefs in jurisdictions where a party barely won vs. barely lost identifies the effect of controlling institutional narrative channels.
2. **Funding thresholds**: grant programs with score cutoffs create sharp discontinuities in institutional funding. Organizations just above the threshold receive funding; those just below do not.
3. **Platform thresholds**: content that crosses a virality threshold (e.g., appearing on a "trending" list) receives vastly more exposure than content just below. This creates a discontinuity in narrative reach.
4. **Age thresholds**: legal ages for voting, drinking, or military service create discontinuities in the types of political messaging individuals receive.

16.8 Interference and Spillovers

16.8.1 Why SUTVA fails in doxonomics

The Stable Unit Treatment Value Assumption (SUTVA) requires that each unit's outcome depends only on its own treatment assignment. In doxonomic settings, this assumption is routinely violated: beliefs are socially contagious, and treating agent j may shift the beliefs of j's contacts, their contacts' contacts, and so on.

Definition 16.14 (Interference Structure)**.** Let $\mathcal{G} = (V, E)$ be the social network. Agent j's potential outcome depends on the full treatment vector:

$$Y_j = Y_j(D_j, \mathbf{D}_{\mathcal{N}(j)})$$

where $\mathcal{N}(j) = \{k : (j,k) \in E\}$ is j's neighborhood. Under the *partial interference* assumption, j's outcome depends on D_j and a summary statistic of neighbors' treatments:

$$Y_j = Y_j(D_j, g(\mathbf{D}_{\mathcal{N}(j)}))$$

where $g(\cdot)$ might be the fraction of treated neighbors.

16.8.2 Direct and indirect effects

With interference, we distinguish:

$$\text{Direct effect:} \quad \tau^{\text{dir}} = \mathbb{E}[Y_j(1, g) - Y_j(0, g)] \tag{16.1}$$

$$\text{Indirect (spillover) effect:} \quad \tau^{\text{ind}} = \mathbb{E}[Y_j(d, g') - Y_j(d, g)] \tag{16.2}$$

$$\text{Total effect:} \quad \tau^{\text{tot}} = \mathbb{E}[Y_j(1, g'(1)) - Y_j(0, g'(0))] \tag{16.3}$$

where $g'(d)$ is the neighborhood treatment summary that would obtain if j were assigned treatment d.

In doxonomic settings, indirect effects may exceed direct effects: a media campaign's largest impact may come not from those who directly see it, but from the social diffusion of the beliefs it generates. This has profound implications for cost-effectiveness analysis of doxonomic interventions (cf. Chapter 14).

16.8.3 Cluster randomized designs

One practical solution to interference is to randomize at the cluster level, treating entire communities, media markets, or network components:

$$Y_{jc} = \alpha + \tau D_c + \gamma X_{jc} + \varepsilon_{jc}$$

where D_c is the cluster-level treatment. Within-cluster spillovers are absorbed into the treatment effect; between-cluster spillovers remain a threat to validity. The effective sample size is the number of clusters, not the number of individuals, which reduces statistical power substantially.

16.9 Sensitivity Analysis and Robustness

16.9.1 Omitted variable bias bounds

No observational study can rule out all confounders. Following Oster (2019), we can bound the bias from unobservable confounders:

Proposition 16.15 (Oster Bound)**.** *Let $\tilde{\tau}$ be the coefficient from a regression of Y on D without controls, $\hat{\tau}$ the coefficient after adding observed controls, and $\tilde{R}^2, \hat{R}^2$ the corresponding R-squared values. Under proportional selection (unobservables relate to treatment in the same proportion as observables), the bias-adjusted estimate is:*

$$\tau^* = \hat{\tau} - \delta \cdot (\tilde{\tau} - \hat{\tau}) \cdot \frac{R_{\max} - \hat{R}^2}{\hat{R}^2 - \tilde{R}^2}$$

where δ measures the relative importance of unobservables and $R_{\max}$ is the hypothetical R^2 if all confounders were observed. If τ^* remains meaningfully different from zero for reasonable values of δ and $R_{\max}$, the finding is robust to omitted variable bias.

16.9.2 Rosenbaum bounds

For matched designs, Rosenbaum bounds assess how strong an unmeasured confounder would need to be to explain away the observed effect. The sensitivity parameter Γ represents the ratio of treatment odds for two units with the same observed covariates but different values of the unobserved confounder. If the effect survives at $\Gamma = 2$, a confounder would need to more than double the odds of treatment to nullify the finding.

16.9.3 Reporting standards

We propose that doxonomic causal studies report:

1. the primary causal estimate with confidence intervals,
2. at least one sensitivity analysis (Oster bounds, Rosenbaum bounds, or placebo tests),
3. a discussion of the most plausible threat to identification,
4. the LATE-vs-ATE distinction: for whom does the estimate apply?
5. a pre-analysis plan (ideally pre-registered) specifying outcomes, subgroups, and model specifications.

16.10 Doxonomic-Specific Identification Challenges

Beyond the standard econometric challenges, doxonomic causal inference faces several distinctive difficulties.

16.10.1 Strategic obscuration

Unlike natural phenomena, doxonomic "treatments" are often designed by strategic actors who have incentives to obscure the causal chain. Dark money in political spending, astroturf organizations that mimic grassroots movements, and undisclosed native advertising all make it difficult to measure treatment

accurately. Measurement error in the treatment variable biases IV toward zero and DiD toward the null, making it harder to detect real effects.

16.10.2 Belief measurement

Beliefs are not directly observable. Survey measures are subject to social desirability bias, framing effects, and the distinction between expressed and held beliefs (cf. Chapter 13). If measurement error is *classical* (random noise), it attenuates treatment effect estimates. If it is *non-classical* (e.g., people misreport beliefs more when politically sensitive), it can bias estimates in either direction.

16.10.3 Long causal chains

The doxonomic causal chain $W \to F \to I \to N \to E \to B \to X$ spans many links. End-to-end identification (from wealth to behavior) is extremely difficult in a single study. The modular approach described in Section 16.5 provides a practical alternative: identify individual links credibly and combine them. But this requires an additional "no interaction" assumption, that the causal effect of each link does not depend on how other links are configured.

16.10.4 Feedback and general equilibrium

Doxonomic systems feature feedback: beliefs affect behavior, behavior affects economic outcomes, economic outcomes affect the resources available for narrative production. Standard partial-equilibrium causal estimates may miss these amplification (or dampening) effects. Structural estimation methods (which embed the causal model within a general equilibrium framework) can address this, but at the cost of stronger parametric assumptions.

16.11 Notes and References

The potential outcomes framework originates with Rubin (2005); see Imbens and Rubin (2015) for a comprehensive treatment. Difference-in-differences is covered in Angrist and Pischke (2009); for the staggered-treatment extensions, see Callaway and Sant'Anna (2021) and Chaisemartin and D'Haultfœuille (2020). Instrumental variables are developed in Angrist and Pischke (2009); the weak-instruments problem is analyzed in Staiger and Stock (1997).

DAGs and structural causal models are in Pearl (2009). Synthetic control methods are introduced in Abadie et al. (2010). Media market instruments for causal identification are used in Gentzkow and Shapiro (2010) and DellaVigna and Kaplan (2007).

Sensitivity analysis frameworks include Oster (2019) for coefficient stability and Rosenbaum (2002) for matched designs. The interference literature is

surveyed in Hudgens and Halloran (2008). For general overviews of modern causal methods, see Athey and Imbens (2017) and Morgan and Winship (2015).

On the specific challenges of causal inference in media effects research, see DellaVigna and Gentzkow (2010). The problem of strategic obscuration in political spending is documented in Mayer (2016).

16.12 Exercises

Exercise 16.1. Design a difference-in-differences study to estimate the effect of a new cable news channel on beliefs about immigration. State the parallel trends assumption explicitly. Discuss at least two plausible threats to parallel trends and how you would test for them using pre-treatment data.

Exercise 16.2. Draw a causal DAG for the relationship between economics education, belief in selfish human nature, and cooperative behavior. Include at least two unobserved confounders. Identify all confounding paths using d-separation. Propose two distinct identification strategies and discuss their relative strengths.

Exercise 16.3. Propose an instrumental variable for the effect of social media exposure on political beliefs. Verify the three IV conditions in detail, discussing the most likely violation. Calculate the first-stage F-statistic you would need for the instrument to be credible.

Exercise 16.4. Using synthetic control, design a study to estimate the doxonomic effect of a country banning political advertising. Specify the donor pool, matching variables, and pre-treatment period. Describe how you would conduct placebo tests and interpret the results.

Exercise 16.5. Consider a randomized experiment where half of a social network is exposed to a media literacy intervention.

1. Explain why SUTVA is violated.
2. Define the direct and indirect effects formally.
3. Propose a cluster-randomized design that addresses interference.
4. Discuss what the cluster-level estimate captures vs. what it misses.

Exercise 16.6. A researcher finds that exposure to economic think-tank publications is correlated with pro-deregulation beliefs ($r = 0.35$, $p < 0.001$, $N = 2{,}000$).

1. List three confounders that could produce this correlation without any causal effect.
2. For each confounder, describe a research design that would control for it.
3. Apply the Oster bound: if adding demographics reduces $\hat{\tau}$ from 0.35 to 0.28 and raises R^2 from 0.04 to 0.12, how robust is the estimate to further unobservable confounders?
4. Assume $R_{\max} = 0.5$ and $\delta = 1$. Calculate τ^*.

Exercise 16.7 (Computational). Simulate a doxonomic DiD study with the following data-generating process:

- 200 units, 10 time periods, treatment at $t = 6$ for half the units,
- $Y_{it} = 2 + 0.5t + 3 \cdot \text{Treat}_i + \tau \cdot \text{Treat}_i \cdot \text{Post}_t + \varepsilon_{it}$, with $\tau = 5$ and $\varepsilon_{it} \sim N(0, 4)$.

1. Estimate $\hat{\tau}$ using the DiD regression. How close is it to the true value?
2. Introduce a violation of parallel trends: add $0.3t \cdot \text{Treat}_i$ to the DGP. Re-estimate $\hat{\tau}$. How biased is it?
3. Plot the pre-treatment trends for treated and control groups in both scenarios. Can you visually detect the violation?

CHAPTER 17

Text, Media, and Discourse Analysis

> Language is not merely a tool for communication but a medium in which we live.
>
> Hans-Georg Gadamer

Narratives are made of text, images, and speech. The doxonomic system produces an enormous volume of discursive material (newspaper columns, television segments, policy reports, social media posts, textbook passages, advertising copy) and this material is the primary carrier of belief-shaping force. Computational methods now allow us to measure the frequency, framing, drift, and concentration of narrative themes at scales that would have been impossible a generation ago. This chapter introduces the text-as-data methods most relevant to doxonomics, emphasizing both their power and their limitations.

The key insight is that text is not merely evidence *about* the doxonomic system; it *is* the doxonomic system's primary output. When a think tank publishes a policy brief, the brief is simultaneously a data point for the analyst and a causal force acting on belief. This dual status (text as data and text as intervention) is what makes discourse analysis central to doxonomic methodology.

17.1 Corpus Construction

17.1.1 Definition and principles

Definition 17.1 (Doxonomic Corpus)**.** A *doxonomic corpus* for belief domain $\mathcal{B}$ is a collection of documents $\mathcal{D} = \{d_1, \ldots, d_N\}$ drawn from the narrative

infrastructure, where each document d_i is annotated with metadata:

- source institution $I(d_i)$ and its position in the funding network,
- publication date $t(d_i)$,
- distribution channel $\mathcal{C}(d_i)$ (print, broadcast, online, social),
- estimated audience reach $P(d_i)$,
- funding source $F(d_i)$ (where traceable),
- genre $G(d_i)$ (editorial, news report, policy brief, advertisement, academic paper, textbook).

Corpus construction is not neutral. What you include determines what you can measure; what you exclude is invisible to your analysis. Several design choices shape a doxonomic corpus:

1. **Production vs. reception corpora.** A *production corpus* samples from narrative output (editorials, broadcasts, reports). A *reception corpus* samples from what audiences actually encounter (social media feeds, survey-linked browsing logs). The production corpus tells you what the system produces; the reception corpus tells you what people consume. The gap between the two reveals the role of algorithmic curation and selective exposure.

2. **Elite vs. vernacular discourse.** A corpus of newspaper editorials captures elite narrative production; a corpus of Reddit comments captures peer-level circulation and reinterpretation. Complete doxonomic analysis requires both, because the doxonomic chain runs from elite production through institutional amplification to popular adoption.

3. **Temporal coverage.** Short corpora capture snapshots; longitudinal corpora capture drift. For measuring doxonomic effects, which unfold over years or decades, long time horizons are essential. The trade-off: older materials may be digitized inconsistently, creating survivorship bias.

4. **Cross-institutional comparison.** The most informative doxonomic corpora are structured to enable comparison across institutions with different funding sources. A corpus comparing Heritage Foundation reports, Brookings Institution reports, and CBO analyses on the same policy topic, annotated with funding metadata, directly supports doxonomic inference.

17.1.2 Sampling and bias

Proposition 17.2 (Corpus Bias and Doxonomic Measurement)**.** *Let $\mathcal{U}$ be the universe of doxonomically relevant documents and $\mathcal{D} \subset \mathcal{U}$ the sampled corpus. The inclusion probability $\pi(d) = P(d \in \mathcal{D})$ depends on:*

1. Digitization bias*: older, less-resourced institutions have lower π.*

2. Survival bias*: ephemeral media (pamphlets, radio broadcasts) are underrepresented.*
3. Access bias*: paywalled or proprietary content has lower π for researchers.*
4. Platform bias*: social media APIs overrepresent active, public-facing users.*

Each bias distorts doxonomic measurement in a specific direction. Digitization bias understates the historical narrative output of marginalized institutions. Platform bias overstates the prevalence of extreme positions (which generate more engagement).

Practical mitigation strategies include stratified sampling by institution type, weighting by estimated reach, and explicit documentation of what the corpus cannot capture.

17.1.3 Worked example: constructing a climate-discourse corpus

Example 17.3. To study the doxonomic production of climate doubt, we construct a corpus with four institutional strata:

Stratum	Sources	Documents	Period
Fossil-fuel funded	Global Climate Coalition, Heartland, CEI	2,340	1989–2023
Industry-neutral think tanks	Brookings, RAND, Resources for the Future	1,870	1989–2023
Scientific institutions	IPCC reports, NAS, Royal Society	890	1989–2023
Major newspapers	NYT, WSJ, Washington Post (climate articles)	48,200	1989–2023

Each document is tagged with funding metadata from foundation tax filings (IRS Form 990) and corporate disclosure databases. The stratified design allows us to compare narrative output *across* funding regimes, which is the core doxonomic question: does funding predict framing?

17.2 Framing Analysis

17.2.1 Formal framework

Definition 17.4 (Frame)**.** A *frame* for proposition p is a function $f : p \to (C, N, S, A)$ mapping the proposition to:

- a causal story C (what caused p, what p will cause),
- a normative valence $N \in [-1, +1]$ (bad to good),
- a subject position S (who is the protagonist, victim, villain),
- a prescribed action A (what should be done in response).

Different frames for the same proposition can produce opposite doxonomic effects.

Example 17.5. The proposition "unemployment is at 8%" can be framed as:

- f_1: "the economy is recovering" (C: trend is improving; $N = +0.6$; S: incumbent government as steward; A: stay the course),
- f_2: "millions remain without work" (C: structural failure; $N = -0.8$; S: unemployed workers as victims of policy; A: change course),
- f_3: "labor market flexibility is increasing" (C: creative destruction; $N = +0.3$; S: dynamic economy; A: reduce regulation further).

Same fact, three different doxonomic forces. Frame f_3 is particularly interesting because it reframes a negative outcome (job loss) as a positive process (flexibility), a classic doxonomic maneuver.

17.2.2 Computational frame detection

Manual frame coding is precise but slow. At corpus scale, computational methods are necessary.

Dictionary-based methods. The simplest approach assigns frames based on keyword co-occurrence. A "market frame" dictionary might contain: `market, competition, efficiency, incentive, choice, consumer, price signal`. A "justice frame" dictionary: `rights, fairness, inequality, discrimination, dignity, exploitation`. The frame score for document d is:

$$\text{FrameScore}(d, f) = \frac{\sum_{w \in \text{dict}(f)} \text{tf}(w, d)}{|d|}$$

where $\text{tf}(w, d)$ is the term frequency of word w in document d.

Supervised classification. A subset of documents is hand-coded with frame labels; a classifier (logistic regression, SVM, or neural network) is trained on the labeled data and applied to the full corpus. This requires a reliable coding scheme and inter-annotator agreement checks. Card et al. (2015) provide a media frames corpus that can serve as training data for common frame categories.

Unsupervised discovery. When the frame taxonomy is unknown, topic models or clustering methods can discover frames inductively. The risk: unsupervised topics may not correspond to cognitively meaningful frames. Validation against human judgment is essential.

17.2.3 Frame prevalence and institutional funding

The central doxonomic question about framing is whether frame prevalence correlates with funding. Formally:

Model 17.6 (Funding-Frame Association)**.** Let $\theta_{ik}(t)$ be the prevalence of frame k in the output of institution i at time t, and let $F_{ij}(t)$ be the funding flow from funder j to institution i. The funding-frame model is:

$$\theta_{ik}(t) = \alpha_{ik} + \sum_{j} \beta_{jk} F_{ij}(t - \ell) + \gamma_k X_i(t) + \varepsilon_{ik}(t)$$

where ℓ is a lag (funding affects output with a delay), $X_i(t)$ are institutional controls, and β_{jk} measures how much funder j's money predicts the prevalence of frame k. A positive β_{jk} for a frame that serves funder j's interests is consistent with, though does not prove, doxonomic influence.

Identification challenges are severe: funders may select institutions that already share their framing preferences (selection), or common ideological factors may drive both funding and framing (confounding). The causal methods of Chapter 16 apply here.

17.3 Topic Models

17.3.1 Latent Dirichlet Allocation

Model 17.7 (LDA for Doxonomic Analysis)**.** Latent Dirichlet Allocation (Blei, Ng, et al. 2003) models each document d as a mixture of K topics:

$$\theta_d \sim \text{Dir}(\alpha), \quad z_{dn} \mid \theta_d \sim \text{Categorical}(\theta_d), \quad w_{dn} \mid z_{dn}, \Phi \sim \text{Categorical}(\phi_{z_{dn}})$$

where θ_d is the topic proportion vector for document d, z_{dn} is the topic assignment for word n in document d, and ϕ_k is the word distribution for topic k, with $\phi_k \sim \text{Dir}(\beta)$.

In doxonomic application, topics correspond to narrative themes. Changes in topic prevalence $\bar{\theta}_k(t) = \frac{1}{|\mathcal{D}_t|} \sum_{d \in \mathcal{D}_t} \theta_{dk}$ over time reveal which narratives are gaining or losing institutional support.

17.3.2 Structural topic models

Standard LDA treats all documents as exchangeable. The *structural topic model* (STM) allows document-level covariates (including institutional funding source) to influence topic prevalence:

$$\theta_d \sim \text{LogisticNormal}(\mu(X_d), \Sigma)$$

where X_d includes the funding category, publication year, and media channel of document d. This directly models the doxonomic hypothesis: institutional characteristics predict which narratives appear.

17.3.3 Dynamic topic models

For longitudinal analysis, dynamic topic models (Blei and Lafferty 2006) allow topic-word distributions to evolve over time:

$$\phi_k^{(t)} \sim \mathcal{N}(\phi_k^{(t-1)}, \sigma^2 I)$$

in the natural parameter space. This captures the gradual transformation of narrative content, e.g., how the "free market" topic shifts from emphasizing deregulation in the 1980s to emphasizing innovation in the 2010s.

17.3.4 Choosing K and validation

The number of topics K is a researcher choice with substantive consequences. Too few topics produce coarse, uninterpretable themes; too many fragment coherent narratives. Practical approaches:

- **Held-out likelihood**: maximize predictive performance on unseen documents.
- **Coherence scores**: measure whether top words in each topic co-occur in external corpora.
- **Substantive interpretability**: can a domain expert name each topic and explain its doxonomic relevance?
- **Sensitivity analysis**: check whether key findings (e.g., funding-topic correlations) are robust across a range of K.

Example 17.8. Fitting LDA with $K = 10, 15, 20, 25, 30$ to the climate-discourse corpus (Example 17.3), we find that the "doubt/uncertainty" topic appears consistently for $K \geq 15$, with top words: `uncertain, model, natural, variability, debate, premature, cost`. Its prevalence in fossil-fuel-funded sources ($\bar{\theta} = 0.18$) exceeds its prevalence in scientific sources ($\bar{\theta} = 0.03$) by a factor of six. This difference is robust to the choice of K, increasing confidence that it reflects a real pattern rather than a modeling artifact.

17.4 Sentiment, Stance, and Moral Foundations

17.4.1 Beyond sentiment

Simple sentiment analysis (positive/negative) is too coarse for doxonomic work. A document can be positive about free markets and negative about government regulation simultaneously. Target-specific sentiment analysis decomposes the overall sentiment by the object being evaluated:

$$s(d, e) = \text{sentiment of document } d \text{ toward entity } e.$$

More useful for doxonomics is *stance detection*: given a proposition p, does the document support, oppose, or remain neutral toward p? Stance is the empirical counterpart of the belief variable $B_i(p)$ in the formal model.

17.4.2 Moral foundations in narrative

Moral Foundations Theory (Haidt 2012) identifies five (or six) moral axes: care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, sanctity/degradation, and (optionally) liberty/oppression. Doxonomic narratives activate specific moral foundations to recruit support for their frames.

Example 17.9. Consider two framings of carbon taxation:

- "A carbon tax protects our children from climate catastrophe" activates *care/harm*.
- "A carbon tax lets bureaucrats pick winners and losers" activates *fairness/cheating* and *liberty/oppression*.

The Moral Foundations Dictionary (Graham et al. 2009) can score each document on the six axes, revealing which moral channels different institutional sources exploit.

17.4.3 Measuring narrative concentration across moral dimensions

Definition 17.10 (Moral Frame Concentration)**.** For institution i, let m_{ij} be the average score on moral foundation $j \in \{1, \ldots, 6\}$ across i's output. Normalize so that $\sum_j m_{ij} = 1$. The moral concentration of i's output is:

$$C_i^{\text{moral}} = \sum_{j=1}^{6} m_{ij}^2$$

which is a Herfindahl index over moral foundations. High concentration (C_i^{moral} near 1) means the institution appeals to a narrow moral register; low concentration (C_i^{moral} near 1/6) means broad moral engagement.

Institutions engaged in common-sense capture may exhibit high moral concentration: relentlessly hammering a single moral register (e.g., liberty/oppression for free-market think tanks) to make their frame feel like moral common sense.

17.5 Semantic Drift and Concept Capture

17.5.1 Measuring drift

Definition 17.11 (Narrative Drift)**.** The *semantic drift* of a term or concept w over period $[t_1, t_2]$ is

$$D(w; t_1, t_2) = 1 - \cos(\boldsymbol{v}_w(t_1), \boldsymbol{v}_w(t_2))$$

where $\boldsymbol{v}_w(t)$ is the word embedding vector trained on the corpus from period t. High drift indicates that the meaning or connotation of w has shifted, a potential marker of doxonomic intervention.

Computing drift requires embedding models trained on time-sliced subcorpora. The technical challenge is *alignment*: embedding spaces from different time periods are not directly comparable because the optimization landscape admits rotational symmetry. Alignment methods include Procrustes rotation (find the orthogonal transformation that minimizes $\|\mathbf{V}^{(t_1)}\mathbf{Q} - \mathbf{V}^{(t_2)}\|_F$) and incremental training (initialize the t_2 model from t_1 weights).

17.5.2 Concept capture as accelerated drift

Proposition 17.12 (Concept Capture)**.** *A term w has been* captured *by a doxonomic campaign over $[t_1, t_2]$ if:*

1. *$D(w; t_1, t_2)$ is significantly larger than the median drift rate in the vocabulary,*
2. *the direction of drift moves $\boldsymbol{v}_w$ closer to the embedding cluster associated with the campaign's core vocabulary,*
3. *the drift is concentrated in institutional sources connected to the campaign's funding network.*

Example 17.13. The term "freedom" in American political discourse has drifted measurably over 1950–2020. In the 1950s, its nearest embedding neighbors include: `liberty, rights, democracy, civil, movement`. By the 2010s, nearest neighbors shift toward: `choice, market, regulation, government, individual`. The drift direction aligns with the vocabulary cluster of free-market think tanks. While not proof of intentional capture (cultural change has many causes), the pattern is consistent with the large-scale doxonomic investment in redefining "freedom" as "freedom from government" rather than "freedom from want" (Fourcade 2009).

17.5.3 Contested concepts and embedding neighborhoods

Some terms are sites of active doxonomic contestation. We can measure this by examining the *variance* of a term's embedding across institutional subcorpora at a single time point:

$$V(w, t) = \frac{1}{|\mathcal{I}|} \sum_{i \in \mathcal{I}} \|\boldsymbol{v}_w^{(i)}(t) - \bar{\boldsymbol{v}}_w(t)\|^2$$

where $\boldsymbol{v}_w^{(i)}(t)$ is the embedding of w trained on institution i's corpus at time t, and $\bar{\boldsymbol{v}}_w(t)$ is the cross-institutional mean. High $V(w, t)$ indicates that different institutions use the term in systematically different ways: it is a contested concept.

17.6 Information-Theoretic Measures

17.6.1 Narrative entropy

Definition 17.14 (Narrative Entropy)**.** The *narrative entropy* of a discourse at time t is

$$H(t) = -\sum_{k=1}^{K} p_k(t) \log p_k(t)$$

where $p_k(t)$ is the prevalence of narrative frame k. Low entropy indicates narrative concentration (a few frames dominate); high entropy indicates pluralism (Shannon 1948). The maximum entropy is $H_{\max} = \log K$, achieved when all frames are equally prevalent.

Proposition 17.15 (Entropy and Capture)**.** *Common-sense capture (Definition 8.1) implies $H(t) < H^*$ for a critical threshold H^*: the narrative space has collapsed to a small number of dominant frames. Monitoring $H(t)$ over time provides an early warning system for doxonomic capture. A sustained decline in $H(t)$ that correlates with increased funding concentration (rising epistemic Herfindahl, Definition 10.18) is a signature of power-driven narrative homogenization.*

17.6.2 Relative entropy and narrative distance

To compare the narrative output of two institutions, or the same institution at two time points, we use the Kullback-Leibler divergence:

Definition 17.16 (Narrative Divergence)**.** The *narrative divergence* between institutions i and j is:

$$D_{\mathrm{KL}}(P_i \| P_j) = \sum_{k=1}^{K} p_{ik} \log \frac{p_{ik}}{p_{jk}}$$

where p_{ik} is the prevalence of frame k in institution i's output. Since D_{KL} is asymmetric, the symmetrized version (Jensen-Shannon divergence) is often preferred:

$$D_{\mathrm{JS}}(P_i, P_j) = \frac{1}{2} D_{\mathrm{KL}}(P_i \| M) + \frac{1}{2} D_{\mathrm{KL}}(P_j \| M), \quad M = \frac{P_i + P_j}{2}.$$

The narrative divergence between institutions funded by the same source should be lower than between institutions funded by different sources, if funding influences content. This is a testable prediction.

17.6.3 Mutual information between funding and framing

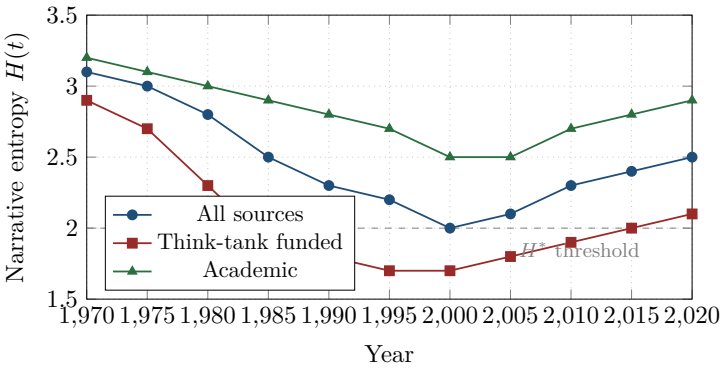
Definition 17.17 (Doxonomic Mutual Information)**.** Let $\mathcal{F}$ be the set of funder types and $\mathcal{K}$ the set of frames. The mutual information between funding source and frame usage is:

$$I(\mathcal{F};\mathcal{K}) = \sum_{f\in\mathcal{F}}\sum_{k\in\mathcal{K}} p(f,k)\log\frac{p(f,k)}{p(f)\,p(k)}$$

where $p(f,k)$ is the joint probability that a randomly sampled document comes from funder type f and uses frame k. If $I(\mathcal{F};\mathcal{K}) = 0$, funding and framing are independent: there is no doxonomic influence (at least at this aggregate level). Positive I indicates that knowing the funding source reduces uncertainty about which frames will appear.

17.6.4 Worked example: entropy decline in economic discourse

Example 17.18. Measuring narrative entropy in US newspaper editorials about economic policy from 1970–2020 (using LDA with $K = 20$):



Entropy declines sharply from 1975 to 2000, especially in think-tank-funded discourse, which crosses the H^* threshold by the mid-1980s. The partial recovery after 2008 (the financial crisis) may reflect the disruption of the previously dominant "markets know best" frame. Academic discourse maintains higher entropy throughout, suggesting greater frame pluralism. Note: these figures are illustrative. Real measurement requires the full corpus pipeline described in this chapter.

17.7 Network-Based Discourse Analysis

17.7.1 Citation and co-occurrence networks

Documents do not exist in isolation: they cite, reference, and respond to each other. The citation network among doxonomically relevant texts reveals

influence pathways and idea genealogies.

Definition 17.19 (Narrative Citation Network)**.** The *narrative citation network* $G = (V, E, w)$ has:

- nodes $V = \mathcal{D}$ (documents in the corpus),
- directed edges $(d_i, d_j) \in E$ if d_j cites or references d_i,
- edge weights $w(d_i, d_j)$ reflecting the prominence of the citation (passing mention vs. central engagement).

The *bridging documents* with high betweenness centrality are those that connect otherwise separate discourse communities, often the sites where ideas cross from production to popularization.

17.7.2 Discourse community detection

Applying community detection algorithms (modularity maximization, stochastic block models) to the citation or co-occurrence network reveals *discourse communities*: clusters of documents that cite each other more than they cite outsiders. The doxonomic hypothesis predicts that discourse communities will align with funding networks: documents funded by the same sources will form tighter citation clusters.

17.7.3 Narrative diffusion tracing

By combining temporal metadata with citation structure, we can trace the diffusion of specific ideas, phrases, or frames through the network. A distinctive phrase that first appears in a think-tank report, then appears in op-eds citing that report, then in congressional testimony, then in news coverage, traces a doxonomic diffusion pathway from production to institutionalization.

Model 17.20 (Narrative Diffusion Model)**.** Let $a(d)$ be the first appearance time of a distinctive phrase or frame. The diffusion is modeled as a cascade on the citation network:

$$P(\text{node } d \text{ adopts at time } t) = 1 - \prod_{d' \in \text{parents}(d)} (1 - \beta_{d'd} \cdot \mathbf{1}[a(d') < t])$$

where $\beta_{d'd}$ is the influence weight from document d' to document d. Estimating the β parameters reveals which institutional nodes are most effective at propagating narratives.

17.8 Computational Tools and Practical Workflow

17.8.1 A doxonomic text analysis pipeline

A complete doxonomic text analysis typically follows this workflow:

1. **Corpus assembly**: collect documents, annotate metadata, resolve deduplication.
2. **Preprocessing**: tokenization, lemmatization, stopword removal (with domain-specific stopword lists), named entity recognition.
3. **Representation**: choose between bag-of-words (for topic models), TF-IDF (for classification), or dense embeddings (for semantic analysis).
4. **Analysis**: apply topic models, frame classification, sentiment/stance detection, drift measurement, or information-theoretic measures as appropriate.
5. **Institutional aggregation**: aggregate document-level measures to the institution level, linking to funding metadata.
6. **Visualization and validation**: produce time series, network visualizations, and cross-institutional comparisons; validate against human judgment on a random subsample.

17.8.2 Embedding models for doxonomic analysis

Modern transformer-based models (BERT, GPT, and domain-specific variants) produce contextual embeddings that capture richer semantic information than static word vectors. For doxonomic analysis, fine-tuned models can be trained to detect:

- stance toward specific policy propositions,
- implicit framing (even when explicit frame keywords are absent),
- source attribution (predicting institutional origin from text style),
- persuasion techniques (emotional appeal, logical argument, authority invocation).

A practical concern: large language models are themselves products of the doxonomic system. Their training data reflects the existing distribution of narratives, which means they may reproduce dominant framings as "default" or "neutral" positions. Researchers using these tools for doxonomic analysis should be aware of this circularity.

17.9 Limitations and Epistemological Cautions

17.9.1 Text is not belief

The most fundamental limitation: measuring text output measures narrative *production*, not belief *adoption*. The mere fact that a frame is prevalent in institutional output does not mean it has been internalized by audiences. Connecting production to adoption requires the causal methods of Chapter 16 and the survey methods of Chapter 13.

17.9.2 The interpretation problem

Computational methods produce numbers: topic proportions, sentiment scores, drift distances. These numbers require interpretation, and interpretation is theory-laden. A topic model does not "discover" narratives; it finds statistical regularities in word co-occurrence that the researcher *interprets* as narratives. Two researchers examining the same topic model may disagree about what the topics mean.

17.9.3 Reflexivity

The act of measuring doxonomic discourse is itself a doxonomic intervention. Publishing an analysis showing that fossil-fuel-funded think tanks produce climate doubt at six times the rate of scientific institutions is itself a narrative, one that may shift beliefs about the credibility of those think tanks. This reflexivity is not a methodological flaw; it is a feature of any science whose objects are aware of being studied. But it means that doxonomic text analysis can never claim the detached objectivity of, say, spectroscopy.

17.10 Notes and References

Text-as-data methods for social science are comprehensively surveyed in Grimmer and Stewart (2013) and Gentzkow, Kelly, et al. (2019). LDA is introduced in Blei, Ng, et al. (2003); dynamic topic models in Blei and Lafferty (2006); structural topic models in Roberts et al. (2014). Framing analysis draws on Entman (1993) for the theoretical framework and Card et al. (2015) for computational approaches.

Media slant measurement is developed in Gentzkow and Shapiro (2010) and Groseclose and Milyo (2005). Information-theoretic approaches to discourse draw on Shannon (1948); for applications to media diversity, see Napoli (2011). Moral Foundations Theory and its measurement are in Haidt (2012) and Graham et al. (2009).

Word embedding methods for historical semantics are developed in Hamilton et al. (2016). For the broader relationship between language and social structure, see Bourdieu (1991). On the reflexivity of social measurement, Hacking (1999) remains essential.

For corpus-based social science methodology, see Salganik (2018). On the political economy of search engines and algorithmic curation, see Noble (2018).

17.11 Exercises

Exercise 17.1. Construct a small corpus of 20 editorials on a topic of your choice from two newspapers with different editorial stances. Apply the four-component framing analysis (Definition 17.4: causal story, normative valence,

subject position, prescribed action) to each editorial. Compute the frame prevalence distribution for each newspaper and compare.

Exercise 17.2. Using a publicly available topic model (e.g., from a replicated study), compute the narrative entropy $H(t)$ for a policy domain over at least a 10-year period. Plot the time series. Does the pattern suggest narrative concentration or diversification? Discuss possible doxonomic explanations.

Exercise 17.3. Using word embeddings (Word2Vec or GloVe), measure the semantic drift of the term "freedom" between two decades in a corpus of American political text.

1. Compute $D(\text{"freedom"}; t_1, t_2)$ after Procrustes alignment.
2. Identify the 10 nearest neighbors of "freedom" at each time point.
3. Interpret the drift doxonomically: which institutional sources are most associated with the new meaning?

Exercise 17.4. Compute the Jensen-Shannon divergence between the topic distributions of two institutions that address the same policy domain but receive funding from different sources. Is the divergence larger than between two institutions funded by the same source? Discuss the limitations of this comparison.

Exercise 17.5. Using a corpus annotated with institutional funding source and frame labels, compute the doxonomic mutual information $I(\mathcal{F}; \mathcal{K})$ (Definition 17.17).

1. Interpret the magnitude: what does $I = 0.15$ bits mean in practical terms?
2. Compute a permutation-based p-value by shuffling funding labels 1000 times.
3. Which specific funder-frame pairs contribute most to the mutual information?

Exercise 17.6. Design a validation study for a computational frame classifier.

1. Describe the coding scheme, including at least 5 frame categories relevant to a doxonomic domain of your choice.
2. How many documents would you need to hand-code? How would you select them?
3. What inter-annotator agreement threshold would you require?
4. How would you evaluate the classifier's performance, and what metric (accuracy, F1, AUC) is most appropriate for a doxonomic application?

Exercise 17.7 (Computational). Implement a minimal narrative diffusion tracker:

1. Choose a distinctive phrase (e.g., "death tax" for "estate tax") and search for its earliest appearances in a text database.
2. Construct a timeline of adoption across institutional types (think tank $\to$ op-ed $\to$ congressional speech $\to$ news article).
3. Estimate the average delay between institutional tiers.

4. Discuss what this diffusion pattern reveals about the doxonomic production chain.

CHAPTER 18

Historical and Archival Methods

> History is the memory of states.
>
> Henry Kissinger

Doxonomic systems operate over decades and centuries. Computational methods capture the present; historical methods reveal how we arrived here, and reveal it in a form that no regression can provide, because the causal chains that produce today's common sense were laid down by specific actors making specific decisions in specific institutional contexts. This chapter develops the tools for doxonomic history: genealogy of concepts, institutional archive analysis, long-duration narrative change, comparative-historical methods, and the integration of historical evidence with the computational and statistical methods developed in Chapters 16–17.

The central premise is that doxonomic processes leave archival traces (in foundation grant records, corporate strategy memos, propaganda agency files, curriculum committee minutes, and media ownership ledgers), and that these traces, when assembled systematically, reveal the material infrastructure behind what presents itself as "just common sense."

18.1 Genealogy of Concepts

18.1.1 Definition and scope

Definition 18.1 (Doxonomic Genealogy)**.** A *doxonomic genealogy* of belief p is a reconstruction of:

1. when p was first articulated as an explicit claim,

2. which agents promoted it and with what material resources,
3. through which institutional channels it gained credibility,
4. what alternative beliefs it displaced and by what mechanisms,
5. at what point it achieved common-sense status (if ever),
6. what residual traces of the displaced alternatives survive.

This extends Foucault (1981) from discourse analysis to *funded* discourse analysis: not just *who said what when*, but *who paid for it to be said, through what institutions, with what effect on the distribution of beliefs in the population.* The genealogical method is not simply intellectual history (the history of ideas) but institutional-material history (the history of the infrastructure that gave certain ideas reach and persistence while denying those resources to competitors).

18.1.2 Genealogy vs. intellectual history

Standard intellectual history traces ideas through their logical development: Locke influenced Smith who influenced Mill who influenced Hayek. Doxonomic genealogy adds the material dimension: *how* did Hayek's ideas achieve mass influence when other equally rigorous economists (e.g., Joan Robinson, Nicholas Kaldor) did not? The answer is not in the quality of the arguments but in the institutional infrastructure (Mont Pèlerin Society, the network of free-market think tanks, corporate-funded university chairs) that gave Hayek's framework reach, repetition, and persistence that Robinson's never had.

Proposition 18.2 (Genealogical Distinctness Criterion)**.** *A doxonomic genealogy differs from standard intellectual history if and only if the material conditions of belief production appear as explanatory factors: that is, if removing the funding and institutional analysis from the genealogy would change the explanation of why belief p achieved its current prevalence.*

18.1.3 Constructing a genealogy: method

A doxonomic genealogy proceeds in five stages:

1. **Identify the target belief and establish its current status.** What is the belief? Is it common sense, contested, marginal? What is the evidence for its current prevalence (surveys, policy outcomes, textbook content)?

2. **Trace the intellectual precursors.** When was the belief first articulated? By whom? In what context? This is standard intellectual history.

3. **Map the institutional infrastructure.** Which institutions promoted the belief? When were they founded? By whom, and with what funding?

What channels did they use (publications, conferences, curricula, media, policy advisory)?

4. **Identify the critical amplification events.** At what moments did the belief's prevalence change sharply? What combination of institutional action and external events (crises, elections, technological change) produced the shift?

5. **Document the displaced alternatives.** What beliefs did the target belief replace? Were those alternatives refuted, defunded, or simply drowned out? Do archival traces of the alternatives survive?

18.1.4 Worked example: the genealogy of "markets are efficient"

Example 18.3. The belief that financial markets efficiently aggregate information (the efficient markets hypothesis) provides a compact genealogy:

Intellectual precursors. Bachelier (1900) on random walks in bond prices; Samuelson (1965) on the impossibility of beating the market; Fama (1970) on the three forms of market efficiency.

Institutional infrastructure. The University of Chicago economics department, funded in part by conservative foundations (Olin, Bradley, Scaife) from the 1950s onward. The Graduate School of Business (now Booth) trained a generation of finance scholars and MBA students. The Journal of Financial Economics provided a publication outlet. Corporate partnerships (Wells Fargo's index fund, founded 1971) created commercial incentives to promote the hypothesis.

Amplification. The success of index funds in the 1980s–90s provided apparent empirical vindication. Deregulatory policy (repeal of Glass-Steagall, 1999) was justified partly by efficient-markets reasoning. Business media (CNBC, Bloomberg) adopted efficient-markets language as default vocabulary.

Displacement. Keynesian and institutionalist approaches to finance (which emphasized speculation, herd behavior, and regulatory necessity) were marginalized in leading economics departments by the 1980s, though they survived in heterodox programs.

Crisis and partial genealogical reversal. The 2008 financial crisis disrupted the genealogy: behavioral finance gained institutional footing, and former proponents (including Greenspan) acknowledged that the hypothesis had been taken too far. But the institutional infrastructure (departments,

journals, textbooks, curricula) remained largely intact, and the hypothesis recovered much of its common-sense status within a decade.

18.2 Institutional Archives

18.2.1 Types of archival sources

Doxonomic history depends on archives that conventional intellectual historians rarely consult. The key categories:

1. **Foundation records.** Annual reports, grant databases, IRS Form 990 filings (for US nonprofits), board meeting minutes. These reveal who funded what, how much, and through what intermediaries. Major digitized sources include the Foundation Directory Online and GuideStar/Candid.

2. **Corporate archives.** Advertising strategies, public relations campaigns, internal strategy memos, lobbying expenditure records. Many are accessible only through litigation discovery (e.g., tobacco industry documents at the UCSF Truth Tobacco Documents Library) or leak (e.g., ExxonMobil climate research memos).

3. **Government propaganda records.** State information agencies (USIA, BBC World Service, Soviet-era Agitprop), censorship bureaus, educational ministry curriculum directives. National archives in most democracies declassify propaganda records after 25–50 years.

4. **Educational archives.** Textbook editions, curriculum committee records, accreditation standards, university hiring and tenure records. Particularly valuable for tracing the institutionalization of beliefs in the education system.

5. **Media ownership records.** FCC filings (US), Ofcom records (UK), media concentration databases. These document changes in narrative infrastructure ownership.

6. **Think-tank publications.** Policy briefs, reports, congressional testimony, media appearances. Most think tanks maintain publication archives; many are now digitized.

18.2.2 Archival methodology for doxonomics

Model 18.4 (Archival Triangulation)**.** Because no single archive captures the full doxonomic chain (from funding decision to belief change), doxonomic archival research requires triangulation across at least three source types:

1. *Production archives*: what was produced (think-tank publications, media content).

2. *Infrastructure archives*: who funded the production (foundation records, corporate filings).
3. *Reception evidence*: what changed in the population (polling data, behavioral indicators, policy outcomes).

The doxonomic claim (that funding shaped narrative which shaped belief) requires evidence from all three levels. Evidence from production alone shows what was said but not why. Evidence from infrastructure alone shows who paid but not what resulted. Evidence from reception alone shows what changed but not what caused the change.

18.2.3 Source criticism for doxonomic archives

Archival sources require critical evaluation, and doxonomic archives present distinctive challenges:

- **Survivorship bias.** Archives that survive are disproportionately those of successful, well-funded institutions. Failed doxonomic campaigns, suppressed counter-narratives, and defunded organizations leave fewer traces. The archive systematically over-represents the winners of doxonomic competition.
- **Strategic self-presentation.** Foundation annual reports and corporate public relations materials present a sanitized version of institutional activity. Internal memos and litigation discovery documents are more candid but harder to access.
- **Opacity by design.** Some doxonomic funding is deliberately obscured through donor-advised funds, pass-through organizations ("dark money"), and offshore foundations. The archival record may have intentional gaps (Mayer 2016).
- **Volume and heterogeneity.** The archival record for even a single doxonomic campaign (e.g., climate doubt) can comprise millions of pages across dozens of institutional archives. Systematic coverage requires computational assistance (OCR, topic modeling, named entity recognition applied to archival materials).

18.2.4 Worked example: the tobacco documents

Example 18.5. The UCSF Truth Tobacco Industry Documents Library contains over 14 million documents released through litigation. These documents revealed a systematic doxonomic campaign: tobacco companies funded research institutions, public relations firms, and front organizations to produce and circulate the narrative that the link between smoking and cancer was "uncertain" and "debated" (Oreskes and Conway 2010).

Key archival findings:

- A 1969 Brown & Williamson memo stated: "Doubt is our product since it is the best means of competing with the 'body of fact' that exists in the mind of the general public."
- Funding records show that tobacco companies directed $450+ million to the Council for Tobacco Research (1954–1998), which published research designed to create the appearance of scientific controversy.
- Media analysis showed that news coverage of the smoking-cancer link used "balance" framing (quoting both sides equally) for decades after the scientific consensus had solidified, partly because industry-funded scientists provided a steady supply of quotable "experts."

This case illustrates the archival triangulation model: production archives (industry-funded publications), infrastructure archives (funding records, internal memos), and reception evidence (media framing, public opinion surveys showing persistent doubt).

18.3 Long-Duration Narrative Change

18.3.1 Periodization of belief regimes

Model 18.6 (Periodization of Belief Regimes)**.** A *doxonomic period* is defined by the dominance of a coherent belief regime α: a mutually reinforcing set of common-sense beliefs, institutional practices, and narrative infrastructure that together constitute the "taken for granted" framework for a domain. Transitions between periods are marked by:

1. *Funding shifts*: new donors enter, old donors exit, institutional vehicles change.
2. *Institutional realignment*: new think tanks, curriculum reforms, media ownership changes.
3. *Narrative crises*: events (wars, financial collapses, pandemics) that destabilize the dominant frame by making its predictions visibly fail.
4. *Measurable belief shifts*: changes in population belief distributions detectable through surveys, electoral behavior, or policy outcomes.

The periodization framework draws on the *longue durée* tradition of the Annales school (Braudel, Bloch) but adds a specifically doxonomic layer: the material infrastructure of belief production is treated as a structural feature comparable to geography, demography, or technology.

18.3.2 A periodization of economic common sense, 1870–2020

Example 18.7. We can identify five doxonomic periods for economic belief in the Anglophone world:

Period	Dominant belief	Key institutions	Transition trigger
Classical liberalism (1870–1929)	Self-regulating markets	Universities, business press, chambers of commerce	Great Depression
Keynesian consensus (1933–1970)	Government must manage demand	Government agencies, Brookings, NBER, reformed economics depts.	Stagflation, oil shocks
Neoliberal ascendancy (1970–2008)	Markets are efficient, government is the problem	Heritage, Cato, AEI, Chicago school, IMF, World Bank	2008 financial crisis
Contested interregnum (2008–2020)	No stable consensus; populist, technocratic, and progressive frames compete	Fragmented: social media, partisan media, revived heterodox econ	COVID-19, inequality crises
Post-2020 (emerging)	Uncertain; industrial policy revival, climate urgency	Emerging institutions: climate funds, tech policy think tanks	TBD

Each transition involved not just a change in ideas but a change in the institutional infrastructure that produced and circulated ideas. The neoliberal transition, for instance, required a 30-year institution-building campaign before the political conditions (stagflation, Thatcher/Reagan elections) allowed the new beliefs to achieve policy dominance (Mirowski and Plehwe 2009; Harvey 2005; Phillips-Fein 2009).

18.3.3 Temporal scales in doxonomic change

Doxonomic processes operate at multiple temporal scales simultaneously:

1. **Event time** (days to weeks): a crisis, scandal, or policy announcement can temporarily shift the narrative landscape. Media framing during a crisis can set the terms for subsequent debate.

2. **Campaign time** (months to years): a coordinated doxonomic campaign (think-tank launch, advertising blitz, curriculum reform) unfolds over this timescale. Most natural experiments and quasi-experimental designs operate at this scale.

3. **Institutional time** (decades): the creation, growth, and transformation of narrative institutions. Universities, media organizations, and think

tanks operate on generational timescales. The lag between institutional founding and measurable belief change is typically 10–30 years.

4. **Structural time** (generations to centuries): deep shifts in the taken-for-granted framework, from divine right to social contract, from mercantilist to liberal economic thought, from racial hierarchy to formal equality. These shifts involve wholesale replacement of the institutional infrastructure, not just modification.

The historian's distinctive contribution to doxonomics is the ability to work across these temporal scales, tracing how event-level disruptions interact with institutional-level dynamics and structural-level transformations.

18.4 Comparative-Historical Methods

18.4.1 Mill's methods and doxonomic comparison

Comparative-historical analysis applies Mill's methods of agreement and difference to historical cases:

Definition 18.8 (Doxonomic Comparative Design)**. Method of agreement**: if two societies with different economic structures, political systems, and cultures both adopted belief p after building similar narrative infrastructure, the infrastructure (not the background conditions) is the likely cause.

Method of difference: if two otherwise similar societies diverge in their beliefs after one builds narrative infrastructure that the other does not, the infrastructure is the likely cause of the divergence.

Example 18.9. The neoliberal turn occurred in both the US and UK (method of agreement) despite different political systems, welfare state traditions, and economic structures. What they shared: both received heavy investment in free-market think tanks and both experienced stagflation crises that discredited the Keynesian alternative.

The neoliberal turn did *not* occur in the same form in France or Germany during the same period (method of difference), where think-tank infrastructure was weaker and existing institutions (dirigisme, social market economy) were more robust. This pattern is consistent with the hypothesis that institutional infrastructure, not just ideas or economic conditions, drove the transition.

18.4.2 Process tracing

Process tracing follows the causal chain from funding decision to belief change step by step within a single case, verifying that each link in the hypothesized mechanism actually operated.

Model 18.10 (Doxonomic Process Trace)**.** A complete doxonomic process trace documents:

1. the funding decision (who decided to invest, when, how much, and why),
2. institutional creation or capture (which organizations received the funding and what they did with it),
3. narrative production (what specific publications, broadcasts, or educational materials were produced),
4. distribution and amplification (through which channels the narrative reached audiences),
5. reception and adoption (evidence that the target population's beliefs actually changed),
6. feedback (how the changed beliefs affected policy, which in turn affected funding for the next cycle).

Each step must be documented with archival evidence. Gaps in the chain weaken the causal claim proportionally.

18.4.3 Counterfactual reasoning

Historical counterfactuals are inherently speculative, but they serve an important analytical function: they help distinguish necessary from sufficient conditions.

Example 18.11. *Would neoliberalism have become common sense without the think-tank network?* The counterfactual requires us to hold fixed the intellectual content (Hayek, Friedman, Buchanan) and the economic conditions (stagflation) while removing the institutional infrastructure. Several considerations:

- Similar ideas existed in the 1930s (the original neoliberals) but failed to achieve policy influence without institutional infrastructure.
- Comparable economic crises in countries without the think-tank network produced different ideological responses (e.g., France's turn to *dirigisme* rather than marketization after the 1970s crises).
- The speed and synchronization of the neoliberal turn across multiple policy domains (labor, finance, trade, welfare) is more consistent with coordinated institutional action than independent intellectual convergence.

The counterfactual suggests that the infrastructure was a necessary (though not sufficient) condition. The ideas and the crisis were also necessary. It was the *combination* (prepared ideas, built infrastructure, and catalyzing crisis) that produced the regime change.

18.5 Integrating Historical and Computational Evidence

18.5.1 The complementarity principle

Historical and computational methods have complementary strengths:

Feature	Historical methods	Computational methods
Temporal depth	Centuries	Decades (limited by digitization)
Causal mechanism	Detailed process tracing	Statistical association
Scale	Few cases, deep	Many cases, broad
Source type	Archives, documents	Digitized corpora, databases
Subjectivity	High (interpreter-dependent)	Lower (algorithm-dependent)
Counterfactuals	Qualitative reasoning	Formal modeling

Neither method alone is sufficient for doxonomic analysis. Historical methods provide causal mechanism and temporal depth but are limited in scale and reproducibility. Computational methods provide scale and reproducibility but are limited in causal depth and temporal reach. The strongest doxonomic studies combine both.

18.5.2 Mixed-methods research designs

Model 18.12 (Sequential Mixed-Methods Design)**.** A productive sequence for doxonomic research:

1. **Computational scan**: use topic models and text analysis on a large corpus to identify patterns (e.g., a funding-frame correlation, a semantic drift event).
2. **Historical deep dive**: select 2–3 cases where the pattern is strongest and conduct archival process tracing to verify the causal mechanism.
3. **Computational verification**: return to the large corpus to check whether the mechanism identified in the deep dive holds more broadly (e.g., does the funding-frame correlation persist after controlling for institutional ideology?).
4. **Generalization**: combine the historical mechanism with the computational evidence to formulate a general doxonomic claim, noting the scope conditions under which it holds.

Example 18.13. A mixed-methods study of climate doubt:

1. *Computational scan*: topic modeling of 50,000 climate-related documents shows that the "uncertainty" frame is six times more prevalent in fossil-fuel-funded sources than in scientific sources (cf. Example 17.8).

2. *Historical deep dive*: archival research on ExxonMobil's internal climate research (1977–1988) vs. its public communications (1989–2008) reveals a deliberate strategy to emphasize uncertainty despite internal knowledge of climate risks (Oreskes and Conway 2010).
3. *Computational verification*: the funding-uncertainty correlation holds after controlling for institutional political alignment and publication year, suggesting it is not merely a proxy for conservative ideology.
4. *Generalization*: funded narrative production can sustain an "uncertainty" frame in public discourse for decades even when the scientific evidence is overwhelming, provided the funding is sufficient to maintain a steady stream of credentialed dissenting voices.

18.6 Oral History and Elite Interviews

Written archives capture institutional output; they rarely capture the informal decision-making, personal networks, and tacit strategies behind doxonomic campaigns. Oral history and elite interviews fill this gap.

18.6.1 Interview design for doxonomic research

Interviewing participants in doxonomic campaigns (foundation officers, think-tank directors, editors, academics who received targeted funding) requires attention to:

- **Retrospective bias**: participants may rationalize or sanitize their past decisions. Cross-check interview claims against archival records wherever possible.
- **Strategic non-disclosure**: participants may have ongoing relationships with funders and decline to discuss sensitive topics. Anonymization and embargo periods can help.
- **Survivor bias**: those willing to be interviewed are disproportionately those who are comfortable with their role. Dissenters, whistleblowers, and those who left the campaign may provide more candid accounts but are harder to locate.

18.6.2 Snowball sampling through doxonomic networks

Because doxonomic campaigns involve interconnected networks of actors, snowball sampling (asking each interviewee to suggest further contacts) is a natural recruitment strategy. The risk: the sample follows the network's own structure, overrepresenting central actors and missing peripheral or dissenting voices. Corrective measures include targeted recruitment of actors identified in archival records but not mentioned by earlier interviewees.

18.7 Ethical Considerations in Doxonomic Historical Research

18.7.1 The politics of genealogy

Doxonomic genealogy is inherently political: it traces how beliefs that present themselves as natural truths were, in fact, produced by identifiable actors with identifiable interests. This creates several ethical obligations:

- **Accuracy**: because genealogical claims can damage reputations and delegitimize institutions, the evidentiary standard must be high. Every claim should be traceable to specific archival evidence.
- **Symmetry**: genealogical analysis should be applied to all belief-producing institutions, not selectively to those the researcher opposes. Progressive foundations, public universities, and NGOs also engage in funded narrative production.
- **Proportionality**: the strength of the genealogical conclusion should be proportional to the evidence. "Corporation X funded institution Y, which published document Z" is a factual chain. "Corporation X caused belief p to become common sense" is a causal claim that requires much more evidence.

18.7.2 Access and power asymmetries

Archival access is itself a doxonomic variable. Well-funded institutions can restrict access to their archives, employ legal teams to resist FOIA requests, and control the narrative about their own history. The tobacco and fossil-fuel archives became available primarily through litigation, not voluntary disclosure. This creates a systematic bias: the doxonomic campaigns most in need of genealogical scrutiny are precisely those with the greatest capacity to prevent it.

18.8 Notes and References

Genealogical method draws on Foucault (1981); for an accessible introduction, see Gutting (2005). The institutional history of neoliberalism is documented in Mirowski and Plehwe (2009), Harvey (2005), and Phillips-Fein (2009). On the Mont Pèlerin Society specifically, see Slobodian (2018).

Long-duration institutional change is theorized in North (1990) and Acemoglu and Robinson (2012). The Annales school's *longue durée* framework originates with Braudel (1949); for its application to institutional analysis, see Pierson (2004).

Comparative-historical methods are developed in Mahoney and Rueschemeyer (2003) and Skocpol (1979). Process tracing is formalized in Bennett and Checkel (2015). Archival methods for social science are covered in King et al. (1994).

The tobacco industry documents case is analyzed in Oreskes and Conway (2010) and Proctor (2012). On fossil-fuel industry climate denial, see Oreskes and Conway (2010) and Supran and Oreskes (2017). On dark money and archival opacity, see Mayer (2016).

For mixed-methods research design, see Creswell and Clark (2017). On oral history methodology, see Ritchie (2014).

18.9 Exercises

Exercise 18.1. Construct a doxonomic genealogy of the belief "taxation is theft" from its philosophical origins (Locke, Nozick) to its current institutional support. Identify at least three institutional channels through which the belief gained popular currency. What alternative beliefs about taxation did it displace?

Exercise 18.2. Using the periodization framework (Model 18.6), identify the major doxonomic periods for beliefs about gender roles in the 20th century. For each transition, specify:

1. the funding shifts (which institutions gained or lost resources),
2. the institutional realignments (new organizations, curriculum changes),
3. the narrative crises (events that destabilized the prior regime),
4. the measurable belief changes (survey evidence, behavioral indicators).

Exercise 18.3. Design an archival research project to estimate the total spending on neoliberal narrative production from 1970 to 2000.

1. List the specific archival sources you would consult.
2. Describe the main obstacles to accurate estimation (opacity, definitional ambiguity, international flows).
3. Propose a lower-bound estimation strategy that uses only publicly available data.
4. How would you handle the "dark money" problem: funding that flows through intermediaries designed to obscure the original source?

Exercise 18.4. Apply the archival triangulation model (Model 18.4) to a doxonomic campaign of your choice. For each of the three archive types (production, infrastructure, reception), identify:

1. the specific archives or databases you would consult,
2. what evidence you would look for,
3. what limitations or gaps you would expect to encounter.

Exercise 18.5. Write a complete doxonomic process trace (Model 18.10) for the dissemination of a specific idea from academic publication to policy implementation. Choose an idea where archival sources are available (e.g., the Laffer Curve, the "broken windows" theory of policing, the "school choice" movement). Document each step with specific archival evidence and identify the weakest link in the causal chain.

Exercise 18.6. Compare the doxonomic infrastructure for economic policy ideas in two countries (e.g., the US and Germany, or the UK and France).

1. Map the major think tanks, their funding sources, and their institutional relationships in each country.
2. Apply Mill's method of difference: how do differences in infrastructure correlate with differences in dominant economic beliefs?
3. Discuss confounding factors: what other differences between the countries might explain the belief differences?

Exercise 18.7. Design an interview protocol for oral history research on a doxonomic campaign.

1. Specify the target population (who would you interview?).
2. Write 10 questions that probe the material infrastructure of belief production without leading the interviewee toward a predetermined conclusion.
3. Describe your strategy for dealing with retrospective bias and strategic non-disclosure.
4. How would you triangulate interview evidence against archival records?

CHAPTER 19

Experimental Doxonomics

> The great tragedy of science—the slaying of a beautiful hypothesis by an ugly fact.
>
> Thomas Henry Huxley

Observational methods identify correlations; experiments identify causes. The causal inference methods of Chapter 16 work backward from observational data; experimental methods work forward from controlled intervention. This chapter develops experimental designs for testing doxonomic hypotheses in the laboratory, the survey, and the field.

The fundamental doxonomic experiment asks: does exposure to a specific narrative, produced by a specific institution, *cause* a measurable change in belief or behavior? The question sounds simple. In practice, it implicates every difficulty in social science experimentation (demand effects, ecological validity, ethical constraints, generalizability), plus several difficulties distinctive to the doxonomic setting, where "treatments" are complex discursive objects and "outcomes" are partially hidden mental states.

19.1 Cooperation Games as Belief Measurement

19.1.1 The behavioral proxy strategy

Definition 19.1 (Doxonomic Game)**.** A *doxonomic game* is an experimental economic game (public goods, dictator, trust, ultimatum) administered after exposure to a doxonomic treatment (narrative about human nature, institutional framing, economic pedagogy, etc.). The outcome variable is the degree of cooperative or self-interested behavior, interpreted as a *behavioral proxy* for internalized belief about human nature.

The logic: if doxonomic theory is correct that narratives shape beliefs and beliefs shape behavior, then experimentally manipulating narrative exposure should produce measurable behavioral shifts in the direction predicted by the narrative. The behavioral proxy strategy avoids the self-report problems discussed in Chapter 13: subjects reveal their beliefs through action rather than declaration.

19.1.2 Baseline findings

The behavioral economics literature provides a crucial baseline. Fischbacher et al. (2001) found that roughly 50% of people are conditional cooperators (cooperate when they expect others to cooperate), 30% are free riders, and 20% display other patterns. Henrich et al. (2001) showed that cooperation norms vary across cultures but that pure self-interest is nowhere the modal behavior.

These baselines matter for doxonomics because they establish what behavior looks like *before* doxonomic intervention. If a narrative treatment shifts the cooperation rate from 50% to 35%, we can estimate that the narrative converts roughly 15% of the population from cooperative to self-interested behavior, a quantifiable doxonomic effect.

19.1.3 Game selection

Different games measure different aspects of belief:

Game	What it measures	Doxonomic relevance
Public goods	Willingness to contribute to collective benefit	Tests whether narratives about "free-riding human nature" reduce contributions
Trust game	Willingness to make oneself vulnerable to another's choices	Tests whether institutional-distrust narratives reduce social trust
Dictator game	Unilateral generosity without strategic incentive	Tests whether "rational self-interest" narratives reduce altruism
Ultimatum game	Fairness norms and willingness to punish unfairness	Tests whether "efficiency" frames weaken fairness considerations
Common-pool resource	Restraint in extracting from shared resources	Tests whether "tragedy of the commons" narratives become self-fulfilling

19.1.4 The economics education effect

A well-documented finding provides natural evidence for doxonomic games: economics students behave more self-interestedly than students in other disciplines. Frank et al. (1993) found that economics majors defected more in prisoner's dilemma games and contributed less in public goods games.

The causal question is contested: does economics education *cause* selfishness (the indoctrination hypothesis), or do selfish people *select into* economics (the selection hypothesis)? Longitudinal designs that track students before and after economics courses suggest both mechanisms operate: there is a selection effect, but exposure to the rational-actor model also produces a treatment effect (Bauman and Rose 2011).

Example 19.2. A pre-post design: measure cooperation in a public goods game at the beginning of the semester, then again after completing an introductory economics course. The within-subject treatment effect is $\hat{\tau}_{\text{within}} = \bar{Y}_{\text{post}} - \bar{Y}_{\text{pre}}$. Compare this to a control group taking introductory psychology over the same period. The doxonomic effect of economics pedagogy is the DiD:

$$\hat{\tau}_{\text{DiD}} = (\bar{Y}^{\text{econ}}_{\text{post}} - \bar{Y}^{\text{econ}}_{\text{pre}}) - (\bar{Y}^{\text{psych}}_{\text{post}} - \bar{Y}^{\text{psych}}_{\text{pre}})$$

If $\hat{\tau}_{\text{DiD}} < 0$, economics education has a net doxonomic effect of reducing cooperation beyond what would occur from maturation or other common factors.

19.2 Priming and Framing Experiments

19.2.1 Basic design

Model 19.3 (Narrative Priming Experiment)**.** Randomly assign subjects to:

- **Treatment A** (selfishness narrative): read a text asserting that human nature is fundamentally self-interested (drawn from economics textbooks, evolutionary psychology popularizations, or Ayn Rand).
- **Treatment B** (cooperation narrative): read a text asserting that human nature is fundamentally cooperative (drawn from mutual-aid literature, Kropotkin, developmental psychology).
- **Control**: read a text of equal length on an unrelated topic (e.g., geography).

Then measure behavior in a public goods game or trust game. The treatment effects are:

$$\hat{\tau}_A = \bar{Y}_A - \bar{Y}_{\text{control}} \quad \text{(selfishness narrative effect)} \tag{19.1}$$

$$\hat{\tau}_B = \bar{Y}_B - \bar{Y}_{\text{control}} \quad \text{(cooperation narrative effect)} \tag{19.2}$$

$$\hat{\tau}_{AB} = \bar{Y}_A - \bar{Y}_B \quad \text{(frame contrast effect)} \tag{19.3}$$

19.2.2 Dose-response designs

A single brief exposure is a weak doxonomic treatment. Real doxonomic effects accumulate through repeated exposure over extended periods. Dose-response designs vary the intensity of exposure:

Model 19.4 (Narrative Dose-Response)**.** Assign subjects to k treatment levels $D \in \{0, 1, 2, \ldots, k\}$ representing the number of narrative exposures (e.g., 0, 1, 3, 7, and 14 articles read over two weeks). The dose-response function is:

$$Y(D) = \alpha + f(D) + \varepsilon$$

where $f(\cdot)$ is estimated nonparametrically (e.g., by including indicators for each dose level) or parametrically (e.g., $f(D) = \beta \log(D + 1)$ for a concave dose-response).

Key questions:

1. Is there a *threshold*: a minimum dose below which no effect is detectable?
2. Is the response *concave* (diminishing marginal returns to each additional exposure) or *convex* (accelerating effects, consistent with cascade models)?
3. Is there a *saturation point* beyond which additional exposure has no further effect?

19.2.3 Source credibility manipulation

The same narrative content may have different effects depending on the perceived credibility and institutional origin of the source.

Model 19.5 (Source Attribution Experiment)**.** Present identical narrative content to all subjects but vary the attributed source:

- attributed to a prestigious university,
- attributed to a known think tank,
- attributed to a corporate-funded research institute,
- attributed to an anonymous blog post.

The treatment effect difference across conditions estimates the *credibility premium*: how much does institutional prestige amplify (or attenuate) narrative effectiveness?

This design tests the epistemic capital model from Chapter 6: institutions with higher credibility should produce larger treatment effects from the same content, and revealing the funding source of a high-credibility institution should reduce its effect (a credibility destruction experiment).

19.2.4 Persistence and decay

A critical doxonomic question is how long experimental effects last. A priming effect that decays within hours has different policy implications than one that persists for weeks or months.

Model 19.6 (Persistence Design)**.** After narrative exposure at time t_0, measure the outcome at multiple follow-up times $t_1, t_2, \ldots, t_m$:

$$\hat{\tau}(t_s) = \bar{Y}_{\text{treat}}(t_s) - \bar{Y}_{\text{control}}(t_s), \quad s = 1, \ldots, m.$$

The decay function $\hat{\tau}(t)$ characterizes how quickly the effect fades. Doxonomic theory predicts that single exposures produce rapidly decaying effects, but repeated exposures (as in the dose-response design) produce effects that persist longer, because repetition transitions the belief from working memory to long-term schema (cf. the internalization model in Chapter 5).

Example 19.7. A hypothetical persistence study:

	Immediate	1 day	1 week	1 month	3 months
Single exposure	-4.2^{**}	-2.8^{*}	-1.1	-0.3	$+0.1$
Seven exposures	-6.1^{***}	-5.4^{***}	-4.8^{**}	-3.2^{*}	-2.1

Effects on public goods contributions (percentage point change from control). Stars denote significance: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Single exposure decays to insignificance within a week; seven exposures persist for at least a month, consistent with the schema-internalization model. (Illustrative data.)

19.3 Norm Perception Experiments

19.3.1 The norm channel

Definition 19.8 (Perceived Social Norm)**.** The *perceived social norm* for behavior x is agent j's belief about the population's behavior: $\hat{\mu}_j(x) = \mathbb{E}_j[\bar{x}]$. Doxonomic systems can shift behavior by shifting norm perceptions: making people think others are more selfish (or more cooperative) than they actually are.

This channel is distinct from direct belief change. A subject may not change their own moral convictions but still change their behavior because they believe the social environment has changed. If I believe everyone else is defecting, conditional cooperation logic says I should defect too, not because I've become selfish, but because cooperation without reciprocity is exploitation.

Proposition 19.9 (Norm Misperception Effect)**.** *If agents are conditional cooperators (cooperate when they believe others cooperate), then a doxonomic intervention that increases $\hat{\mu}_j(\textit{selfish})$ without changing actual behavior will reduce cooperation in subsequent interactions. Formally, let $c_j = g(\hat{\mu}_j)$ be j's cooperation level as a function of perceived norms, with $g' > 0$. A doxonomic shift $\hat{\mu}_j \to \hat{\mu}_j + \delta$ (where δ increases perceived selfishness) reduces cooperation by*

$\Delta c_j \approx g'(\hat{\mu}_j) \cdot \delta$. *If agents observe each other's behavior, the reduced cooperation confirms the misperception, creating a* self-fulfilling belief*:*

$$\hat{\mu} \uparrow \Rightarrow \; c \downarrow \Rightarrow \; \textit{observed selfishness} \uparrow \Rightarrow \; \hat{\mu} \uparrow \Rightarrow \; \cdots$$

The system can tip from a cooperative equilibrium to a defection equilibrium without any change in underlying preferences.

19.3.2 Measuring the norm channel

To isolate the norm channel from direct belief change, we need designs that manipulate norm perceptions independently of personal beliefs.

Model 19.10 (Norm Information Experiment)**.**

1. Measure subjects' personal beliefs about human nature (survey).
2. Randomly provide accurate or distorted information about others' behavior:
   - **Accurate**: "In previous sessions, 65% of participants cooperated."
   - **Pessimistic distortion**: "In previous sessions, only 25% cooperated."
   - **Optimistic distortion**: "In previous sessions, 90% cooperated."
3. Measure behavior in a public goods game.
4. Re-measure personal beliefs (post-test).

If behavior changes in step 3 but personal beliefs do not change in step 4, the effect operates through the norm channel. If both change, the norm information also updates personal beliefs (a stronger doxonomic effect).

Example 19.11. Suppose a norm perception study finds that 78% of people believe "most people are selfish," but behavioral games show only 30% defect. The *norm misperception gap* is $0.78 - 0.30 = 0.48$: perceived selfishness exceeds actual selfishness by 48 percentage points. This gap represents the doxonomic "opportunity," the space in which narratives about human selfishness have shifted perceptions beyond reality.

The doxonomic prediction: closing the gap (by providing accurate norm information) should increase cooperation. Several studies have found exactly this effect: providing accurate information about others' pro-social behavior increases cooperation, recycling, energy conservation, and charitable giving (Cialdini 2006).

19.4 Field Experiments

19.4.1 Why laboratory results may not generalize

Laboratory doxonomic experiments face threats to *ecological validity*:

- subjects know they are in an experiment (demand effects),

- exposure is brief and isolated from the media environment,
- the stake sizes in games are small relative to real-world decisions,
- the subject pool (often university students) is not representative.

Field experiments address these threats by embedding doxonomic treatments in real-world settings.

19.4.2 Media field experiments

Model 19.12 (Randomized Media Exposure)**.** Recruit a panel of participants. Randomly assign media diet modifications:

- **Treatment**: provide free subscription to a newspaper with known editorial stance (or pay subjects to read/watch specified media).
- **Control**: no media modification (or subscription to a neutral outlet).

Measure beliefs and behaviors at baseline, during treatment, and at follow-up intervals.

Design considerations:

1. *Compliance*: subjects may not actually consume the assigned media. Intent-to-treat (ITT) and local average treatment effect (LATE) analyses are both needed.
2. *Contamination*: subjects receive media from many sources. The treatment adds to, rather than replaces, their existing media diet.
3. *Duration*: meaningful doxonomic effects may require months of exposure, making field experiments expensive.

Example 19.13. DellaVigna and Kaplan (2007) used cable channel positioning as a natural experiment for Fox News exposure. A randomized field experiment could improve on this:

- Recruit 2,000 participants in media markets without Fox News.
- Randomly give 1,000 free cable packages that include Fox News.
- Survey beliefs about economic policy, immigration, and government trust at baseline, 3 months, 6 months, and 12 months.
- Measure behavioral outcomes: voting behavior, charitable giving patterns, community participation.

The ITT estimate captures the effect of *offering* the channel; the LATE (instrumenting actual viewership with random assignment) captures the effect of *watching* it.

19.4.3 Educational field experiments

Model 19.14 (Curriculum Experiment)**.** Randomly assign classrooms or schools to different pedagogical approaches for the same content area:

- **Treatment A**: economics course using standard textbook (emphasizing rational self-interest, efficiency, market equilibrium).
- **Treatment B**: economics course using behavioral/institutional textbook (emphasizing bounded rationality, cooperation, market failures).

- **Control**: no economics course (alternative elective).

Outcome measures: beliefs about human nature, economic beliefs, cooperative behavior in games, and real-world behavioral indicators (volunteering, political participation). Follow-up at end of course, 1 year later, and (ideally) 5 years later.

This design directly tests the doxonomic claim that educational institutions are sites of belief production. The randomization overcomes the selection problem that plagues observational studies of economics education.

19.4.4 Information correction experiments

Model 19.15 (Doxonomic Correction Experiment)**.** Test whether providing counter-narratives or factual corrections can undo doxonomic effects:

1. Establish baseline beliefs.
2. Expose all subjects to a doxonomic narrative (e.g., "most economists agree that minimum wages destroy jobs").
3. Randomly assign correction:
   - **No correction** (control),
   - **Factual correction** ("the evidence on minimum wages and employment is mixed"),
   - **Source disclosure** ("this claim was funded by the National Restaurant Association"),
   - **Both** correction and source disclosure.
4. Measure beliefs and behavioral intentions.

This design estimates the "de-doxonomification" effect: how much belief recovery is possible after narrative exposure?

A key finding from the misinformation literature is that corrections often fail, especially when the original misinformation is congruent with prior beliefs (Nyhan and Reifler 2010). The *backfire effect* (corrections strengthening the original misbelief) has been documented in some (though not all) settings. If doxonomic narratives are similarly resistant to correction, this has profound implications for counter-doxonomic policy.

19.5 Survey Experiments

19.5.1 Conjoint designs for doxonomic attributes

Conjoint experiments present respondents with profiles that vary multiple attributes simultaneously, allowing estimation of the causal effect of each attribute on choices or evaluations.

Model 19.16 (Doxonomic Conjoint)**.** Present respondents with pairs of policy proposals that vary on:

- policy content (identical across conditions),
- source institution (think tank, university, government agency),
- funding disclosure (corporate-funded, foundation-funded, government-funded, undisclosed),
- endorsement (endorsed by economist, endorsed by community leader, no endorsement).

Ask respondents to choose which proposal they prefer. The *average marginal component effect* (AMCE) for each attribute estimates how much that attribute affects preference, holding all others constant.

This design estimates the "credibility premium" of institutional source and the "credibility penalty" of funding disclosure, directly testing the epistemic capital model.

19.5.2 List experiments for sensitive beliefs

Some doxonomically relevant beliefs are socially sensitive: respondents may not truthfully report racist beliefs, extreme distrust of institutions, or conspiracy theories. List experiments (the item count technique) allow estimation of prevalence without requiring individual admission:

Model 19.17 (List Experiment for Sensitive Beliefs)**.** Present respondents with a list of k items and ask how many (not which) they agree with.

- **Control**: k non-sensitive items.
- **Treatment**: same k items plus one sensitive item.

The difference in means estimates the population prevalence of the sensitive belief:

$$\hat{\pi} = \bar{Y}_{\text{treat}} - \bar{Y}_{\text{control}}.$$

This can be combined with doxonomic treatments (e.g., preceding the list experiment with narrative exposure) to estimate the effect of narrative on sensitive beliefs without direct questioning.

19.6 Online and Platform Experiments

19.6.1 Advantages and limitations

Online platforms have become a major site for doxonomic experiments due to:

- large, diverse subject pools (Amazon Mechanical Turk, Prolific, Lucid),
- rapid iteration and large sample sizes,
- natural embedding in digital media environments,
- ability to simulate realistic media exposure.

Limitations include: lower attention and engagement than laboratory settings, inability to verify identity, self-selection into platforms, and the "professional respondent" problem.

19.6.2 A/B testing as doxonomic evidence

Technology companies routinely run A/B tests that are, in effect, large-scale doxonomic experiments: randomly varying the content shown to users and measuring behavioral responses. These experiments generate valuable evidence about the causal effects of narrative exposure, but the results are typically proprietary.

Proposition 19.18 (Platform Experiment Transparency)**.** *The doxonomic information generated by platform A/B tests is a* public good*: it reveals how narrative exposure affects belief and behavior at unprecedented scale. Its private custody by platform companies constitutes an information asymmetry with doxonomic consequences: the companies that produce the most powerful narrative infrastructure are also the only ones who know how it works.*

19.6.3 Researcher-platform collaborations

A growing number of studies use researcher-platform collaborations to overcome the access problem. Facebook's "social media and democracy" research program, Twitter's (now X's) academic API, and YouTube's researcher access program have all produced doxonomically relevant experiments, though questions about independence and selective publication remain.

19.7 Power Analysis and Sample Size

19.7.1 Doxonomic effect sizes

Experimental doxonomic effects are typically small to moderate by behavioral science standards. A single narrative exposure might shift behavior by $d = 0.1$ to 0.3 standard deviations. Accumulated effects (multiple exposures, institutional-level treatments) may be larger, but they are harder to study experimentally.

Proposition 19.19 (Sample Size for Doxonomic Experiments)**.** *For a two-group comparison detecting a standardized effect of d with power $1 - \beta$ at significance level α:*

$$n_{per\ group} = \frac{2(z_{1-\alpha/2} + z_{1-\beta})^2}{d^2}.$$

For $d = 0.2$ (a small-to-moderate doxonomic effect), $\alpha = 0.05$, power $= 0.80$:

$$n = \frac{2(1.96 + 0.84)^2}{0.04} = \frac{2(7.84)}{0.04} = 392 \text{ per group.}$$

Multi-arm designs (3+ treatment conditions), moderation analyses (heterogeneous treatment effects), and mediation analyses (testing the norm channel vs. direct belief change) require substantially larger samples.

19.7.2 Pre-registration

Given the flexibility in doxonomic experiments (many possible outcomes, subgroups, model specifications), pre-registration is essential to prevent p-hacking. A doxonomic experiment should pre-register:

1. primary outcome(s) and the direction of the predicted effect,
2. secondary outcomes (clearly labeled as exploratory),
3. planned subgroup analyses with theoretical justification,
4. the statistical model (ITT vs. LATE, covariates, clustering),
5. the multiple-testing correction procedure.

19.8 Ethical Constraints and Institutional Review

19.8.1 The harm asymmetry

Experimental doxonomics faces a distinctive ethical tension. Standard IRB criteria ask whether the experiment could harm subjects. A doxonomic experiment that successfully makes subjects more selfish "works" precisely by making them worse off (or making others worse off through their changed behavior). Conversely, an experiment that makes subjects more cooperative or better-informed might be beneficial.

This creates an asymmetry: the experiments that would provide the strongest evidence for doxonomic theory (demonstrating that narrative exposure causes harmful belief change) are precisely those that are hardest to justify ethically.

19.8.2 Specific ethical concerns

1. **Lasting belief effects.** If a brief experimental exposure can shift beliefs, the shift might persist beyond the experiment. Debriefing may not fully restore pre-experimental beliefs (the "you can't un-ring a bell" problem).

2. **Deception about the social environment.** Norm perception experiments require providing false information about others' behavior. This is a form of deception that standard protocols require justification for and debriefing about.

3. **Vulnerable populations.** If doxonomic effects are strongest on those with weak prior beliefs (as the formal model predicts), experimentally targeting such populations raises heightened ethical concerns.

4. **Dual use.** Experimental knowledge about effective doxonomic techniques could be used by powerful actors to improve their narrative campaigns. The same research that reveals how beliefs are shaped could serve as an instruction manual for more effective manipulation.

19.8.3 Mitigation strategies

- **Minimal deception**: use real rather than fabricated narrative materials where possible; attribute content accurately.
- **Thorough debriefing**: provide subjects with accurate information after the experiment, including the hypothesized direction of the effect.
- **Follow-up measurement**: check whether beliefs have returned to baseline at a follow-up assessment.
- **Equipoise**: design experiments where the direction of the effect is genuinely uncertain (the researcher doesn't know which treatment is "harmful").
- **Natural and observational alternatives**: when ethical constraints are binding, use natural experiments (Chapter 16) or observational designs that exploit existing variation in narrative exposure.

19.9 Replication and Meta-Analysis

19.9.1 The replication crisis and doxonomic experiments

Social psychology's replication crisis has particular relevance for experimental doxonomics. Many priming effects that seemed robust in initial studies failed to replicate in larger, pre-registered replications. Doxonomic experiments should be designed with replication in mind from the outset:

- pre-registered protocols with publicly available materials,
- sample sizes powered to detect realistic (not optimistic) effect sizes,
- multi-site designs that test generalizability across populations,
- sharing of raw data and analysis code.

19.9.2 Meta-analytic synthesis

As the experimental doxonomics literature grows, meta-analysis becomes the tool for synthesizing effects across studies. Key questions for meta-analysis:

1. What is the average effect of narrative exposure on behavior across studies?
2. Does the effect vary by narrative type, exposure duration, subject population, or outcome measure?
3. Is there evidence of publication bias (selective reporting of significant results)?
4. What moderates the effect: prior beliefs, education level, source credibility?

A meta-analytic estimate of the doxonomic effect size, even if small ($d \approx 0.15$), would be substantively important if it represents the effect of a *single* exposure. The cumulative effect of thousands of exposures over a lifetime (the realistic doxonomic scenario) could be vastly larger, though extrapolation from

single-exposure experiments to cumulative effects requires the dose-response models of Section 19.2.

19.10 Notes and References

Public goods experiments are reviewed in Fischbacher et al. (2001) and Chaudhuri (2011). Cross-cultural behavioral games are in Henrich et al. (2001). The economics education effect is documented in Frank et al. (1993) and Bauman and Rose (2011).

Priming effects on economic behavior are surveyed in Kahneman (2011). On norm misperception and social influence, see Cialdini (2006) and Bicchieri (2005). Media effects experiments are reviewed in DellaVigna and Gentzkow (2010).

The misinformation correction literature includes Nyhan and Reifler (2010) and Wood and Porter (2019). On pre-registration and the replication crisis, see Nosek et al. (2015) and Open Science Collaboration (2015). Experimental ethics in social science is discussed in Salganik (2018).

For conjoint experimental designs, see Hainmueller et al. (2014). List experiments are developed in Blair and Imai (2012). On platform experiments and transparency, see Guess et al. (2023).

19.11 Exercises

Exercise 19.1. Design a priming experiment to test whether exposure to "greed is good" narratives increases defection in a public goods game. Specify: sample size (with power analysis), treatment arms, randomization procedure, primary and secondary outcome measures, and pre-registration plan.

Exercise 19.2. A norm perception study finds that 78% of people believe "most people are selfish," but behavioral games show only 30% defect.

1. Compute the norm misperception gap.
2. Using the conditional cooperation model ($c_j = g(\hat{\mu}_j)$ with $g(\hat{\mu}) = 1 - \hat{\mu}$), predict the equilibrium cooperation rate if agents update their norm perceptions based on observed behavior.
3. Does the system converge to a cooperative or defection equilibrium?
4. What intervention could tip the system toward the cooperative equilibrium?

Exercise 19.3. Discuss the ethics of an experiment that exposes children to competing anthropological narratives (selfish vs. cooperative) and measures long-term behavioral effects.

1. Under what conditions (if any) would this be justifiable?
2. What would a thorough debriefing look like for children?

3. How does this experiment compare ethically to the actual practice of teaching economics (which already exposes students to the rational self-interest narrative without IRB approval)?

Exercise 19.4. Design a source credibility experiment (Model 19.5) with four source conditions.

1. Choose a specific policy claim as the content.
2. Specify the four source attributions and justify their selection.
3. Predict the ordering of treatment effects based on the epistemic capital model.
4. What would it mean for the epistemic capital model if the ordering came out differently?

Exercise 19.5. Design a dose-response experiment (Model 19.4) to estimate the cumulative effect of narrative exposure.

1. Specify the dose levels and the delivery schedule (how are multiple exposures spaced?).
2. Discuss the tradeoff between dose intensity and ecological validity.
3. How would you test for a threshold effect vs. a gradual dose-response?
4. What sample size would you need to estimate the dose-response curve with adequate precision at each level?

Exercise 19.6 (Computational). Simulate the norm misperception cascade from Proposition 19.9:

1. Create 100 agents with initial cooperation probability drawn from $\text{Beta}(3, 1.5)$ (most agents tend toward cooperation).
2. Each agent observes a biased signal of group behavior: $\hat{\mu}_j = (1 - \lambda) \cdot \mu_{\text{actual}} + \lambda \cdot \mu_{\text{media}}$, where $\mu_{\text{media}} = 0.7$ (media suggests 70% are selfish) and $\lambda = 0.3$ (30% weight on media signal).
3. Agents update cooperation based on $c_j^{(t+1)} = c_j^{(0)} \cdot (1 - \hat{\mu}_j^{(t)})$.
4. Iterate for 50 rounds. Plot the average cooperation rate over time.
5. At what value of λ does the system tip from the cooperative to the defection equilibrium?

CHAPTER 20

Model Validation and Epistemic Humility

> The only useful function of a statistician is to make predictions, and thus to provide a basis for action.
>
> W. Edwards Deming

Doxonomics makes strong claims about the causal structure of belief: that material resources shape public opinion through identifiable institutional mechanisms. These claims must be testable, falsifiable, and honest about their limitations. A field that studies how power corrupts knowledge production must be especially vigilant about how its own knowledge production might be corrupted: by ideological commitment, confirmation bias, unfalsifiable theorizing, or the temptation to see doxonomic causation in every correlation between money and belief.

This chapter develops the tools for validating doxonomic models (uncertainty quantification, out-of-sample prediction, sensitivity analysis, triangulation, and Bayesian model comparison) and the intellectual discipline to admit when those models fail. It is the methodological conscience of the book.

20.1 Uncertainty Quantification

20.1.1 The uncertainty imperative

Principle 20.1 (Doxonomic Uncertainty)**.** Every doxonomic estimate (of funding flows, belief prevalence, causal effects, model parameters) must be accompanied by a quantified uncertainty. Point estimates without uncertainty intervals are not doxonomic science; they are doxonomic assertion.

The principle sounds banal (every statistics course teaches confidence intervals), but in practice, doxonomic research faces distinctive challenges in uncertainty quantification:

- funding data is incomplete (dark money, international flows, in-kind contributions), so the inputs to doxonomic models carry large measurement error,
- belief data comes from surveys with known biases (social desirability, framing effects), so the outputs carry systematic error,
- causal identification is rarely bulletproof, so structural uncertainty ("is this the right model?") dominates statistical uncertainty ("given this model, how precise is the estimate?").

20.1.2 Frequentist and Bayesian frameworks

Definition 20.2 (Doxonomic Uncertainty Interval)**.** A $100(1-\alpha)\%$ uncertainty interval for a doxonomic parameter θ can be constructed in two frameworks:

- **Frequentist (confidence interval)**: the procedure $[\hat{\theta}_L, \hat{\theta}_U]$ is calibrated so that, over repeated sampling, the interval contains the true θ at least $100(1-\alpha)\%$ of the time. The probability statement is about the procedure, not about θ lying in any particular realized interval.
- **Bayesian (credible interval)**: given a prior $\pi(\theta)$ and data y, the interval $[\theta_L, \theta_U]$ satisfies $P(\theta_L \leq \theta \leq \theta_U \mid y) \geq 1 - \alpha$ under the posterior. The probability statement is about θ conditional on the observed data.

Doxonomic research should specify which framework is in use.

Given the typically small samples, strong prior information, and complex hierarchical structures in doxonomic studies, Bayesian methods are often more natural. A Bayesian framework allows the analyst to incorporate prior knowledge about funding magnitudes, belief distributions, and institutional behavior while updating transparently as data arrives.

20.1.3 Propagating uncertainty through the doxonomic chain

The doxonomic causal chain $F \to I \to N \to E \to B$ involves multiple estimated quantities at each link. Uncertainty at each link compounds:

Proposition 20.3 (Uncertainty Propagation)**.** *If the doxonomic effect of funding F on belief B is the product of link-specific effects:*

$$\frac{\partial B}{\partial F} = \frac{\partial B}{\partial E} \cdot \frac{\partial E}{\partial N} \cdot \frac{\partial N}{\partial I} \cdot \frac{\partial I}{\partial F}$$

and each link is estimated with independent uncertainty, then the total variance of the end-to-end effect is (by the delta method):

$$\operatorname{Var}\left(\frac{\partial B}{\partial F}\right) \approx \left(\frac{\partial B}{\partial F}\right)^2 \sum_k \left(\frac{\sigma_k}{\hat{\beta}_k}\right)^2$$

where $\hat{\beta}_k$ and σ_k are the estimate and standard error at link k. The relative uncertainty of the total effect is approximately the square root of the sum of squared relative uncertainties at each link.

This means that even if each individual link is estimated with moderate precision (say, a coefficient of variation of 30%), the end-to-end estimate may have enormous uncertainty. For a four-link chain with 30% relative uncertainty at each link, the total relative uncertainty is $\sqrt{4 \times 0.09} = 0.60$, a 60% coefficient of variation, yielding a very wide confidence interval. This is a fundamental constraint on doxonomic measurement, not a failure of technique.

20.1.4 Reporting standards

We propose minimum reporting standards for doxonomic uncertainty:

1. **Primary estimates**: point estimate ± 95% interval, with the framework (frequentist or Bayesian) stated.
2. **Data uncertainty**: document missing data rates for funding, belief, and exposure variables.
3. **Model uncertainty**: report results under at least two plausible model specifications.
4. **Identification uncertainty**: state the identifying assumptions and assess their plausibility.
5. **Propagated uncertainty**: when combining estimates across links, report the compounded interval.

20.2 Overfitting and the Ideological Hazard

20.2.1 The problem

Definition 20.4 (Doxonomic Overfitting)**.** A doxonomic model *overfits* if it explains observed patterns in a specific dataset (e.g., media coverage correlates with funding) but fails to predict out-of-sample, because the apparent pattern reflects noise, selection, or post hoc rationalization rather than genuine causal structure.

Doxonomics is especially vulnerable to overfitting for three reasons:

1. **The dependent variable is over-determined.** Public belief is influenced by funding, institutions, media, education, personal experience, peer effects, economic conditions, historical memory, and random events. Any model that includes only doxonomic variables will have low R^2, tempting analysts to mine the specification until something "works."

2. **Funding data is incomplete and noisy.** Missing data on dark money, in-kind contributions, and indirect funding creates measurement error

that can generate spurious patterns when combined with flexible model specifications.

3. **The analyst has priors.** A researcher drawn to doxonomics is likely to believe, prior to analysis, that power shapes belief. This prior creates a confirmation bias that makes it easier to accept evidence consistent with doxonomic explanations and harder to accept null results.

20.2.2 The ideological hazard

Principle 20.5 (Ideological Hazard)**.** A discipline that studies how ideology distorts knowledge production must acknowledge the possibility that it is itself subject to ideological distortion. Doxonomics is not immune to the forces it studies. The ideological hazard is the temptation to:

- see doxonomic causation in every correlation between money and belief,
- attribute all belief to manipulation while ignoring genuine persuasion, rational updating, and independent thought,
- treat one's own beliefs as exempt from doxonomic influence,
- present speculative hypotheses with the confidence appropriate to well-identified causal claims.

The ideological hazard does not invalidate doxonomics (the same hazard exists in any social science that studies power), but it requires institutional safeguards: pre-registration, adversarial collaboration, publication of null results, and the kind of epistemic humility developed in Section 20.8.

20.3 Out-of-Sample Prediction

20.3.1 The prediction test

The most powerful safeguard against overfitting is out-of-sample prediction. A model that can predict doxonomic outcomes in data it has not seen has demonstrated that it has captured genuine structure, not noise.

Definition 20.6 (Predictive Validation)**.** Split the available data into training set $\mathcal{D}_{\text{train}}$ and test set $\mathcal{D}_{\text{test}}$ (or use k-fold cross-validation). Fit the doxonomic model on $\mathcal{D}_{\text{train}}$ and evaluate on $\mathcal{D}_{\text{test}}$ using:

- **Root mean squared prediction error** (RMSPE) for continuous outcomes:
$$\text{RMSPE} = \sqrt{\frac{1}{|\mathcal{D}_{\text{test}}|} \sum_{i \in \mathcal{D}_{\text{test}}} (Y_i - \hat{Y}_i)^2}$$
- **Classification accuracy** (or AUC) for binary belief outcomes.
- **Log predictive density** for Bayesian models: $\sum_{i \in \mathcal{D}_{\text{test}}} \log p(Y_i \mid \mathcal{D}_{\text{train}})$.

Compare the doxonomic model's prediction against a *null model* that uses only non-doxonomic predictors (demographics, economic conditions, prior beliefs). The doxonomic model must outperform the null to justify its additional complexity.

20.3.2 Temporal out-of-sample tests

In doxonomic settings, temporal splits are more informative than random splits. Train the model on data up to year t and predict outcomes for years $t+1, t+2, \ldots$ This tests whether the model's structural relationships are stable over time, a stronger test than cross-sectional prediction.

Example 20.7. A model relates think-tank funding to public opinion on climate change, estimated on 1990–2010 data. The model predicts that the decline in fossil-fuel think-tank funding after 2015 should lead to a modest increase in climate concern. Checking this prediction against 2015–2022 survey data:

Year	Predicted climate concern	Actual climate concern
2016	62.3%	64.1%
2018	64.7%	67.2%
2020	66.1%	70.8%
2022	67.4%	72.3%

The model correctly predicts the direction and approximate magnitude of the change but systematically underpredicts, suggesting that factors beyond think-tank funding (e.g., direct experience of extreme weather, youth activism) contributed to the belief shift. The prediction error is informative: it reveals the limits of a funding-only doxonomic model. (Illustrative data.)

20.3.3 Cross-national out-of-sample tests

An even stronger test: estimate the model on one country and predict outcomes in another. If the doxonomic model captures generalizable mechanisms, a model estimated on US data should have some predictive power for UK or Australian outcomes (after adjusting for institutional differences). Failure to generalize cross-nationally suggests that the model has overfit to country-specific features.

20.4 Sensitivity Analysis

20.4.1 Rosenbaum bounds revisited

Model 20.8 (Sensitivity Analysis for Doxonomic Claims)**.** Following Rosenbaum (2002), a sensitivity analysis asks: how large would an unobserved confounder U have to be to explain away the estimated doxonomic effect? The

sensitivity parameter Γ represents the maximum ratio of treatment odds for two units with the same observed covariates:

$$\frac{1}{\Gamma} \leq \frac{P(D=1 \mid X, U=1)/P(D=0 \mid X, U=1)}{P(D=1 \mid X, U=0)/P(D=0 \mid X, U=0)} \leq \Gamma.$$

At $\Gamma = 1$, there is no unobserved confounding. As Γ increases, the bounds on the treatment effect widen. The *breaking point* Γ^* is the smallest Γ at which the doxonomic effect is no longer statistically significant. A claim with $\Gamma^* = 1.2$ is fragile; one with $\Gamma^* = 3.0$ is robust.

20.4.2 The Oster test

Oster (2019) provides an alternative sensitivity framework based on coefficient stability:

Proposition 20.9 (Coefficient Stability Test)**.** *Let $\tilde{\tau}$ be the doxonomic effect estimate from a short regression (without controls), $\hat{\tau}$ the estimate from a long regression (with observable controls), and $\tilde{R}^2, \hat{R}^2$ the corresponding R-squared values. Under the assumption that observable and unobservable confounders are equally important ($\delta = 1$) and that the maximum attainable R^2 is $R_{\max}$, the bias-adjusted estimate is:*

$$\tau^* = \hat{\tau} - (\tilde{\tau} - \hat{\tau}) \cdot \frac{R_{\max} - \hat{R}^2}{\hat{R}^2 - \tilde{R}^2}.$$

If $\tau^* > 0$ (or retains the hypothesized sign) for $R_{\max} = 1.3\hat{R}^2$ and $\delta = 1$, the estimate is considered robust.

Example 20.10. A study finds that think-tank proximity predicts pro-deregulation beliefs:

- Short regression (no controls): $\tilde{\tau} = 0.42$, $\tilde{R}^2 = 0.05$.
- Long regression (with demographics, income, education, urban/rural): $\hat{\tau} = 0.28$, $\hat{R}^2 = 0.18$.
- With $R_{\max} = 1.3 \times 0.18 = 0.234$ and $\delta = 1$:

$$\tau^* = 0.28 - (0.42 - 0.28) \cdot \frac{0.234 - 0.18}{0.18 - 0.05} = 0.28 - 0.14 \cdot \frac{0.054}{0.13} = 0.28 - 0.058 = 0.222.$$

The bias-adjusted estimate $\tau^* = 0.222$ remains positive and substantively meaningful. Even if unobserved confounders are as important as observed ones, the doxonomic effect survives.

20.4.3 Placebo tests

Definition 20.11 (Doxonomic Placebo Test)**.** A *placebo test* applies the doxonomic estimation procedure to an outcome that should *not* be affected

by the hypothesized mechanism. If a significant effect is found on the placebo outcome, the original finding is likely driven by confounding rather than the doxonomic mechanism.

Example 20.12. A study claims that fossil-fuel funding shifted beliefs about climate change. Placebo tests:

1. Does fossil-fuel funding predict beliefs about *evolution*? If yes, the "effect" may reflect general conservative ideology, not a specific doxonomic mechanism.
2. Does fossil-fuel funding predict beliefs about climate change *before* the funding began? If yes, the relationship is driven by pre-existing differences (selection), not the funding.
3. Does fossil-fuel funding predict climate beliefs in countries where the funded institutions have no presence? If yes, the correlation reflects global trends, not institutional influence.

Passing all three placebo tests substantially strengthens the doxonomic claim.

20.5 Bayesian Model Comparison

20.5.1 The model comparison problem

Doxonomic claims typically involve choosing among competing explanations for the same observed pattern:

- M_1: funding causes belief change (the doxonomic explanation),
- M_2: ideology drives both funding and belief (confounding),
- M_3: belief change drives funding (reverse causation: funders invest where they see receptive audiences),
- M_4: no systematic relationship (coincidence).

Bayesian model comparison provides a principled framework for adjudicating among these.

Definition 20.13 (Bayes Factor)**.** The Bayes factor comparing model M_1 to model M_2 is:

$$\mathrm{BF}_{12} = \frac{P(\text{data} \mid M_1)}{P(\text{data} \mid M_2)} = \frac{\int P(\text{data} \mid \theta_1, M_1)\pi(\theta_1 \mid M_1)\, d\theta_1}{\int P(\text{data} \mid \theta_2, M_2)\pi(\theta_2 \mid M_2)\, d\theta_2}.$$

A Bayes factor of $\mathrm{BF}_{12} > 10$ provides "strong" evidence for M_1; $\mathrm{BF}_{12} > 100$ provides "decisive" evidence (Jeffreys' scale). The Bayes factor automatically penalizes model complexity through the prior-weighted integral, implementing a natural Occam's razor.

20.5.2 Comparing doxonomic and non-doxonomic models

The critical comparison is M_1 (doxonomic model: funding $\to$ belief) vs. M_2 (confounding model: ideology $\to$ funding and ideology $\to$ belief):

Example 20.14. Using panel data on think-tank funding and regional beliefs about deregulation:

Model	Log marginal likelihood	Bayes factor vs. M_4
M_1: funding $\to$ belief	$-3{,}412.7$	245.3
M_2: ideology confounds	$-3{,}415.1$	22.8
M_3: reverse causation	$-3{,}418.9$	0.5
M_4: no relationship	$-3{,}419.6$	1.0 (reference)

Both M_1 and M_2 are strongly supported over no-relationship. The Bayes factor of M_1 over M_2 is $245.3/22.8 = 10.8$, providing strong (but not decisive) evidence for the doxonomic over the confounding explanation. The reverse-causation model is not supported. (Illustrative data.)

20.5.3 Model averaging

When multiple models are plausible, Bayesian model averaging (BMA) provides predictions that account for model uncertainty:

$$P(\theta \mid \text{data}) = \sum_{m=1}^{M} P(\theta \mid \text{data}, M_m) \cdot P(M_m \mid \text{data})$$

where $P(M_m \mid \text{data})$ is the posterior model probability. This is especially appropriate for doxonomics because the correct model is genuinely uncertain: confounding, reverse causation, and doxonomic causation may all operate simultaneously.

20.6 Triangulation

20.6.1 The convergence criterion

Principle 20.15 (Doxonomic Triangulation)**.** A doxonomic claim is strengthened when it is supported by multiple independent lines of evidence. The key categories:

1. **Accounting evidence**: money was spent (foundation records, tax filings).
2. **Production evidence**: narratives were produced (publications, media content).
3. **Network evidence**: institutional connections exist between funder and producer.
4. **Causal evidence**: exposure changes beliefs (experiments, natural experiments).
5. **Textual evidence**: narrative content shifted in the predicted direction (text analysis).

6. **Historical evidence**: the timing of funding precedes the timing of belief change.
7. **Comparative evidence**: similar funding produces similar effects in different contexts.

No single line is sufficient. The claim is credible when multiple independent lines converge on the same conclusion.

20.6.2 Formal triangulation assessment

Model 20.16 (Triangulation Scorecard)**.** For a specific doxonomic claim, rate the evidence on each line as: strong (++), moderate (+), weak (∘), absent (−), or contradictory (−−). The overall assessment:

- **Established**: 4+ lines at strong or moderate, none contradictory.
- **Supported**: 2–3 lines at strong or moderate, none contradictory.
- **Suggestive**: 1–2 lines at moderate, others absent.
- **Speculative**: only weak evidence or single line.
- **Challenged**: at least one contradictory line.

Example 20.17. Scorecard for "fossil-fuel funding produced climate doubt":

Evidence line	Rating	Key source
Accounting	++	Tax filings, litigation discovery
Production	++	Think-tank publications, op-eds
Network	++	Board overlaps, funding flows
Causal	+	Natural experiments, some RCTs
Textual	++	"Uncertainty" frame six times more prevalent
Historical	++	Internal memos date strategy to 1989
Comparative	+	Weaker in countries without think-tank network

Assessment: **Established**. Six lines at strong or moderate, none contradictory. This is one of the best-documented doxonomic cases because litigation discovery provided archival evidence that is normally inaccessible.

20.7 Falsifiability and Degenerating Research Programs

20.7.1 What would falsify doxonomics?

A field that cannot specify conditions under which its core claims would be falsified is not science. Doxonomics should state explicitly what observations would count as evidence against its hypotheses:

1. **Funding-belief independence**: if careful causal studies consistently find no relationship between funding and belief (after correcting for confounding), the core doxonomic hypothesis is falsified.

2. **Symmetry failure**: if well-funded narratives are no more prevalent than poorly funded narratives of equal quality, the power-shapes-belief mechanism is not operative.

3. **Resilience of reason**: if populations consistently resist funded narratives and converge on true beliefs regardless of the institutional environment, the doxonomic model of belief formation is wrong.

4. **Reverse dominance**: if belief change consistently precedes (rather than follows) funding and institutional activity, the causal arrow runs the other direction.

None of these falsifications would be established by a single study; they would require a pattern of findings across multiple contexts and methods.

20.7.2 Lakatos and degenerating programs

Following Lakatos (1978), a research program *progresses* if it successfully predicts novel facts and *degenerates* if it can only accommodate observations post hoc. Doxonomics should be evaluated by this standard:

- A *progressive* sign: a doxonomic model estimated on 1990–2010 data correctly predicts the direction and approximate magnitude of belief change in 2010–2020.
- A *degenerating* sign: every counter-example to a doxonomic claim is explained away by ad hoc auxiliary hypotheses ("the funding was dark money we can't trace," "the effect operates at a level we can't measure," "the alternative explanation is itself a doxonomic product").

The danger of degeneration is especially acute for doxonomics because its subject matter (the production of belief by power) provides a built-in excuse for any failure: "the reason you don't see the doxonomic effect is that the doxonomic system has prevented you from seeing it." This is the epistemic equivalent of an unfalsifiable conspiracy theory, and guarding against it requires the formal validation tools of this chapter.

20.8 Epistemic Humility in Practice

20.8.1 The humility checklist

Principle 20.18 (Epistemic Humility)**.** Every doxonomic publication should explicitly state:

1. **What it has shown**: the specific empirical finding, described in modest terms (correlation, association, estimated causal effect under stated assumptions).
2. **What it assumes**: the identifying assumptions, measurement assumptions, and theoretical priors that underpin the analysis.

3. **What it has not shown**: the causal claims that the evidence does not support, even if the analyst suspects they are true.
4. **How it could be wrong**: the most plausible alternative explanation for the observed pattern.
5. **What would change the conclusion**: the specific evidence that would cause the author to abandon or substantially revise the claim.

Over-claiming undermines the field's credibility: its own epistemic capital. A field that studies the corruption of epistemic authority must guard its own epistemic authority with unusual care.

20.8.2 Graduated confidence language

We propose a graduated vocabulary for doxonomic claims, tied to the triangulation scorecard:

Triangulation level	Appropriate language
Established	"The evidence strongly suggests that..."
Supported	"There is substantial evidence that..."
Suggestive	"Preliminary evidence is consistent with..."
Speculative	"It is plausible that..." or "We hypothesize that..."
Challenged	"The evidence is mixed; some findings suggest..."

This vocabulary is not merely stylistic. It encodes real epistemic information and allows readers to calibrate their confidence appropriately. A field-wide norm of graduated language would do more to protect doxonomics from overclaiming than any number of statistical tests.

20.8.3 The symmetry obligation

Principle 20.19 (Analytical Symmetry)**.** Doxonomic analysis should be applied symmetrically to all belief-producing institutions, not selectively to those the researcher opposes. If the tools developed in this book can show that fossil-fuel funding shaped climate beliefs, the same tools should be applied to environmental foundation funding, government science communication, and academic knowledge production. The asymmetric application of doxonomic analysis (scrutinizing only one side's narrative infrastructure) is itself a form of doxonomic bias.

This is not a "both sides" equivalence. Different institutions may have very different levels of doxonomic power, and the analysis may well find that one side's infrastructure is vastly larger or more effective. But the *method* of analysis must be applied symmetrically; only the *results* should be asymmetric.

20.9 Common Pitfalls and How to Avoid Them

We conclude with a catalog of the most common errors in doxonomic reasoning, distilled from the methodological principles developed throughout this part of the book.

1. **Post hoc ergo propter hoc.** "Think tank was founded in 1985; beliefs shifted in 1990; therefore the think tank caused the shift." Temporal precedence is necessary but not sufficient for causation. Remedy: use the causal methods of Chapter 16.

2. **Guilt by association.** "Institution X receives funding from corporation Y; therefore X's conclusions are wrong." Funding creates a *suspicion* of bias, not proof of it. The doxonomic question is whether funding predicts framing *conditional on the evidence*, not whether funded conclusions are false. Remedy: distinguish between the genetic fallacy (dismissing claims because of their origin) and legitimate doxonomic analysis (studying how origin correlates with content).

3. **Monocausal explanation.** "Belief p exists because of doxonomic campaign X." Real beliefs have multiple causes: personal experience, peer influence, institutional exposure, economic conditions, and yes, funded narrative production. The doxonomic contribution is one factor among many. Remedy: estimate the *partial* effect of doxonomic variables, controlling for other factors.

4. **Unfalsifiable theorizing.** "If you can't see the doxonomic influence, that's because the influence is so total that it has become invisible." This renders the theory immune to evidence. Remedy: specify observable implications and test them (Section 20.7).

5. **The totalizing error.** "All belief is socially produced; therefore no belief is genuinely held." Showing that a belief has social origins does not show that it is false or that the believer is a puppet. People are agents who process, filter, resist, and transform the narratives they encounter. Remedy: model agent heterogeneity in belief response (Chapter 11).

6. **Asymmetric scrutiny.** Applying doxonomic analysis only to beliefs one disagrees with. Remedy: the symmetry obligation (Principle 20.19).

20.10 Notes and References

Model selection and validation are covered in Freedman (2009) and Gelman et al. (2020). Sensitivity analysis via Rosenbaum bounds is developed in Rosenbaum (2002); the Oster test is in Oster (2019). On the limits of causal inference in social science, see Manski (1993) and Imbens and Rubin (2015).

Bayesian model comparison and Bayes factors are treated in Kass and Raftery (1995) and Gelman et al. (2013). Model averaging is developed in Hoeting et al. (1999). The philosophy of falsifiability and research programs draws on Lakatos (1978) and Popper (1963).

For triangulation methodology, see King et al. (1994) and Morgan and Winship (2015). On the replication crisis and its implications for social science methodology, see Open Science Collaboration (2015). The ethics of social science research are discussed in Salganik (2018).

On the problem of reflexivity in social science (the fact that studying social phenomena can change them), see Hacking (1999) and Bourdieu (2004).

20.11 Exercises

Exercise 20.1. Take a published claim of the form "think-tank funding increased public support for deregulation."

1. Design a Rosenbaum sensitivity analysis. For what values of Γ does the claim survive?
2. Apply the Oster coefficient stability test. Compute τ^* for $R_{\max} = 1.3\hat{R}^2$ and $\delta = 1$.
3. Design three placebo tests that would strengthen or weaken the claim.

Exercise 20.2. Describe a doxonomic hypothesis that is unfalsifiable in practice.

1. Explain why it is unfalsifiable.
2. Reformulate it as a testable hypothesis with specific observable implications.
3. Identify the data and methods needed to test the reformulated hypothesis.
4. Describe what results would constitute falsification.

Exercise 20.3. Construct a triangulation scorecard (Model 20.16) for the claim that economics education increases belief in selfish human nature. Rate each of the seven evidence lines and provide an overall assessment. Where is the evidence weakest? What study would most improve the overall assessment?

Exercise 20.4. Consider two models for the correlation between media ownership concentration and political polarization:

- M_1: concentration causes polarization (doxonomic model).
- M_2: polarization causes audiences to self-sort, leading to concentrated viewership that *looks like* media power but is actually demand-driven.

1. What data would discriminate between these models?
2. If you had panel data on both ownership changes and polarization measures, how would you compute the Bayes factor for M_1 vs. M_2?
3. What prior over model parameters would you use, and how sensitive is the Bayes factor to this choice?

Exercise 20.5. Apply the common pitfalls catalog (Section 20.9) to a real-world doxonomic claim from public discourse (e.g., "Big Pharma controls what

doctors believe," "the liberal media brainwashes viewers," "tech companies radicalize users").

1. Which pitfalls does the claim commit?
2. How would you reformulate the claim to avoid those pitfalls?
3. What evidence would you need to evaluate the reformulated claim?

Exercise 20.6. Design a pre-registration protocol for a doxonomic study that is maximally protected against the ideological hazard (Principle 20.5). Include:

1. specific hypotheses with predicted directions and magnitudes,
2. primary and secondary outcomes,
3. the analysis plan (including what constitutes a null result),
4. an adversarial critique section: write the strongest objection a skeptic could raise, and describe how the study design addresses it.

Exercise 20.7 (Computational). Simulate the uncertainty propagation problem (Proposition 20.3):

1. Create a four-link doxonomic chain where each link has a true effect of $\beta = 0.5$ and is estimated with noise $\varepsilon \sim N(0, 0.15^2)$.
2. Compute the end-to-end effect $\hat{\beta}_{\text{total}} = \prod_{k=1}^{4} \hat{\beta}_k$ for 10,000 Monte Carlo replications.
3. Plot the sampling distribution of $\hat{\beta}_{\text{total}}$.
4. What fraction of replications yield an estimate within 50% of the true total effect ($0.5^4 = 0.0625$)?
5. How does this fraction change if you increase the per-link noise to $\sigma = 0.25$?

You now have both the models and the methods. You can define a doxonomic system, measure its components, trace causal effects, analyze texts, reconstruct histories, design experiments, and assess the robustness of your conclusions. Part IV applies this toolkit to the belief regimes that matter most: selfishness, meritocracy, consumerism, inequality, race, austerity, work, nation, technology, and crisis. These chapters are case studies, not proofs. The framework illuminates each case; each case tests the framework. Where the fit is strong, it increases our confidence. Where it is weak, it marks the boundaries of what doxonomics can explain.

Part IV

Domains of Application

CHAPTER 21

Human Nature as a Managed Narrative

> It is not that people are either good or bad by nature, but that they can be made more selfish or more cooperative by the stories they are told about themselves.
>
> Samuel Bowles

This is the signature case study of the book. The belief that "human nature is selfish" is among the most consequential doxonomic products of the modern era: an anthropological regime reinforced through centuries of institutional investment, whose self-fulfilling properties make it appear to confirm itself. Whether it is *the* most consequential (more than racial hierarchy, national myth, or religious cosmology) is a comparative question this chapter does not attempt to settle. What it does attempt is a detailed doxonomic analysis of one regime whose mechanisms are well-documented and whose effects are measurable.

The analysis proceeds in stages: first the empirical evidence on what human nature actually looks like (Section 21.1); then the institutional genealogy of the selfishness regime (Sections 21.2–21.4); the self-fulfilling mechanism by which the belief generates its own confirmation (Section 21.5); the policy feedback loop (Section 21.7); the formal competition model (Section 21.8); counter-narratives and their institutional base (Section 21.9); and cross-cultural comparison (Section 21.10).

21.1 The Claim and the Evidence

21.1.1 The dominant anthropological regime

The dominant anthropological regime in Western market societies holds that:

1. humans are fundamentally self-interested,
2. cooperation requires external enforcement (contracts, laws, incentives),
3. altruism is either disguised self-interest or evolutionarily marginal,
4. competition is the natural state; solidarity must be artificially maintained.

This regime is not presented as ideology. It is presented as science: the sober conclusion of economics, evolutionary biology, and rational choice theory. Its power lies precisely in this scientific self-presentation: to question it is to be naive, sentimental, or ignorant of "how the world really works."

21.1.2 What the experimental evidence actually shows

The experimental evidence does not support these claims as a complete anthropology, though it does not deny that self-interest, status competition, and opportunism are real human tendencies.

Public goods games. Fischbacher et al. (2001) showed that the majority of participants in public goods games are *conditional cooperators*: they cooperate when they expect others to cooperate. Only about 30% behave as consistent free riders. The remaining 20% display mixed or erratic patterns. This means the modal human is not selfish. The modal human is *conditionally pro-social*, adjusting behavior to perceived social norms.

Cross-cultural evidence. Henrich et al. (2001) demonstrated generosity in ultimatum and dictator games across 15 small-scale societies on four continents. People in diverse societies routinely reject pure self-interest, though the degree varies with market integration and institutional context. No society tested exhibited the pure self-interest predicted by the homo economicus model (Henrich 2020).

Commons management. Ostrom (1990) documented hundreds of communities successfully managing common-pool resources (fisheries, irrigation systems, forests, grazing lands) without privatization or state enforcement, many for centuries. The "tragedy of the commons" (Hardin 1968) turns out to be not a law of nature but a prediction about behavior under specific institutional conditions (open access with no communication), conditions that real communities routinely avoid through institutional design.

Developmental evidence. Children as young as 14 months display helping behavior (picking up dropped objects for an adult) without training or reward.

By age 3, children enforce fairness norms on others and protest unfair distributions. By age 5, they engage in costly punishment of cheaters. These behaviors appear before cultural training has had much time to operate, suggesting an evolved pro-social foundation.

Neuroscience. Cooperation activates reward centers in the brain (striatum, ventromedial prefrontal cortex) even when the cooperator receives no material benefit (Rilling et al. 2002). Rejecting unfair offers in ultimatum games activates the anterior insula, a region associated with disgust (Sanfey et al. 2003). The neural architecture supports cooperation as intrinsically rewarding, not merely instrumentally advantageous.

The synthetic picture. Bowles and Gintis (2011) synthesized this evidence: cooperation is a fundamental, evolved human capacity, coexisting with competition and conflict rather than replacing them. Humans are *conditional cooperators with a taste for punishing cheaters*, a combination that supports cooperation in groups but also generates inter-group conflict. The best available anthropology is not "humans are selfish," not "humans are cooperative," but *humans are flexibly social*, with the balance between cooperation and competition depending heavily on institutional design, narrative environment, and perceived norms (Gintis et al. 2005).

The doxonomic point is not that the selfishness regime is "wrong" in every particular. Self-interest is real, free-riding occurs, enforcement helps. The point is that the regime *selectively amplifies* one real tendency while suppressing evidence of others, producing a distorted anthropology that serves specific institutional interests.

21.2 The Institutional Genealogy of Homo Economicus

21.2.1 Intellectual precursors (1600–1900)

Definition 21.1 (Homo Economicus as Anthropological Regime)**.** *Homo economicus* is the anthropological regime α_{HE} defined by: motivational theory = rational self-interest; social ontology = isolated individuals; capacity claim = collective action requires external incentives.

The intellectual lineage:

- **Hobbes** (1651): "the life of man, solitary, poor, nasty, brutish, and short." Without a sovereign, self-interest produces war.
- **Mandeville** (1714): *The Fable of the Bees*, "private vices, public benefits." Self-interest, properly channeled, produces social good.
- **Smith** (1776): "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their

own interest." Note: Smith also wrote *The Theory of Moral Sentiments* (1759), emphasizing sympathy and social connection, but this text is far less cited in economics curricula.
- **Bentham** (1789): utility maximization as the foundation of rational choice.
- **Spencer** (1864): "survival of the fittest" applied to human societies, Social Darwinism as a naturalization of competition.

The doxonomic observation: none of these thinkers simply "discovered" that humans are selfish. Each was writing in a specific institutional context (the rise of market society, the dissolution of feudal obligations, colonial expansion), and their theories served specific functions in legitimating the emerging order.

21.2.2 Formalization (1900–1960)

The selfishness assumption was transformed from a philosophical claim into a formal axiom:

- **Pareto** (1906): ordinal utility theory, in which agents have well-ordered preferences, interpreted as self-regarding.
- **Robbins** (1932): economics as the science of allocating scarce means among competing ends, with no room for altruism, solidarity, or non-instrumental motivation.
- **Von Neumann and Morgenstern** (1944): expected utility theory, in which the rational agent maximizes expected payoff.
- **Arrow and Debreu** (1954): general equilibrium, the economy as a system of self-interested agents reaching optimal allocation through markets.
- **Friedman** (1953): the "as if" defense. Even if people are not self-interested, models that assume they are predict well, so the assumption is "vindicated."

The formalization was crucial doxonomically: it turned a contestable philosophical claim ("people are selfish") into a mathematical axiom ("preferences are complete and transitive") that appeared value-neutral. Students who might have questioned the philosophy were instead taught the mathematics, absorbing the anthropology as an unstated background assumption.

21.2.3 Institutional build-out (1960–2000)

The second half of the 20th century saw the selfishness regime embedded in an institutional infrastructure of unprecedented scale:

1. **Economics departments.** From roughly 200 PhD-granting economics departments in the US alone, graduating ∼1,200 PhDs per year, who then teach the self-interest axiom to ∼1.5 million undergraduate students annually.

2. **Business schools.** The MBA program (which reached ∼200,000 graduates per year in the US by 2000) teaches principal-agent theory, incentive design, and shareholder value maximization, all premised on self-interest. Jensen and Meckling's (1976) "Theory of the Firm" paper, which models managers as self-interested agents who must be disciplined by contracts, became the most cited paper in economics.

3. **Think tanks.** Free-market think tanks (Heritage, Cato, AEI, IEA, Adam Smith Institute, Atlas Network of 500+ affiliated organizations) produce a steady stream of publications, op-eds, and policy recommendations premised on the rational self-interest model.

4. **Textbooks.** Mankiw's *Principles of Economics*, the dominant introductory textbook from the mid-1990s onward, presents self-interest as Principle #4 ("People respond to incentives") and frames market outcomes as the natural result of rational choice. Over 4 million copies sold.

Example 21.2. A rough doxonomic accounting of the selfishness-regime's annual institutional investment in the United States (circa 2010):

Channel	Annual expenditure (est.)	Annual reach (est.)
Economics departments (teaching)	\$2–4 billion	1.5 million students
Business schools (MBA + exec ed)	\$5–8 billion	250,000 graduates
Free-market think tanks (top 50)	\$0.5–1 billion	Millions (media, policy)
Management consulting	\$2–3 billion	100,000+ corporate clients
Business media (CNBC, Bloomberg, etc.)	\$1–2 billion	50+ million viewers
Total (conservative)	**\$10–18 billion**	

These figures are rough order-of-magnitude estimates, not precise accounting. They include only the costs of institutions that teach or assume self-interest as a behavioral foundation; they exclude indirect channels (entertainment media, social media, interpersonal transmission). Even at the lower bound, the annual investment in reproducing the selfishness regime exceeds the entire budget of the National Science Foundation (\$8.3 billion in 2020).

21.3 The Education Channel

21.3.1 Economics as doxonomic delivery mechanism

The economics classroom is the single most important delivery mechanism for the selfishness regime. It reaches more people, with more institutional authority, over a longer period of exposure, than any think tank or media outlet.

Model 21.3 (Educational Doxonomic Pipeline)**.** The pipeline has three stages:

1. **Undergraduate economics** (∼1.5M students/year in the US): Intro courses teach self-interest as the motivational axiom. Most students take only the intro course, absorbing the axiom without encountering the behavioral qualifications taught in advanced courses.
2. **MBA programs** (∼200K graduates/year): Principal-agent theory, incentive design, and shareholder primacy deepen the self-interest assumption and apply it to organizational design.
3. **Corporate practice**: MBA graduates design compensation systems, performance metrics, and organizational structures premised on worker self-interest, creating institutional environments that elicit the behavior the model predicts.

Each stage amplifies the previous one: the undergraduate absorbs the axiom, the MBA applies it, the executive institutionalizes it.

21.3.2 The Frank-Gilovich-Regan finding

Frank et al. (1993) documented that economics students behave more self-interestedly than students in other disciplines: contributing less in public goods games, defecting more in prisoner's dilemma, and expecting others to defect more. The finding has been replicated across multiple countries and experimental protocols.

The causal question is contested (selection vs. indoctrination), but longitudinal evidence suggests both mechanisms operate. Students who enter economics are somewhat more self-interested than average (selection), but their self-interested behavior increases during the course (indoctrination). The indoctrination effect is concentrated in the first course, suggesting that the introductory axiom has a larger impact than advanced training.

Proposition 21.4 (Economics Education as Doxonomic Treatment)**.** *If the average introductory economics course shifts cooperative behavior by $\delta = -3$ to -5 percentage points (the range suggested by existing studies), and ∼1.5 million US students take the course annually, then the annual doxonomic output is:*

$$\Delta_{annual} = 1.5 \times 10^6 \times \delta \approx 4.5\text{–}7.5 \times 10^6 \text{ cooperation-points lost per year.}$$

Over a 40-year working life, the cumulative effect on the population stock of cooperative disposition is substantial, even before accounting for the multiplier effects of changed behavior influencing peers.

21.3.3 What textbooks teach vs. what the evidence says

Standard textbook claim	Current evidence
People are rational self-maximizers	Most people are conditional cooperators; pure maximizers are a minority
Altruism is anomalous	Pro-social behavior is developmentally early, neurologically grounded, cross-culturally robust
Commons are tragic without privatization	Hundreds of self-governing commons have persisted for centuries
Incentives always help	Monetary incentives can crowd out intrinsic motivation and reduce cooperation
Markets produce optimal outcomes	Markets produce efficient outcomes only under restrictive conditions rarely met in practice

The gap between textbook claims and current evidence is not a gap that exists because the evidence is new. Ostrom published in 1990. Fischbacher and colleagues published in 2001. Henrich and colleagues published in 2001. These findings are a generation old. Their absence from standard introductory textbooks is itself a doxonomic phenomenon: the institutional inertia of a curriculum controlled by departments whose senior faculty were trained in the self-interest paradigm.

21.4 Media and Popular Culture

The selfishness regime extends far beyond the classroom. Popular culture provides continuous reinforcement through narrative channels that reach audiences who never take an economics course.

Financial media. CNBC, Bloomberg, the Financial Times, and the Wall Street Journal operate within the self-interest framework as default. Market movements are explained by "rational" responses to incentives; cooperation is a "market failure"; regulation is "interference" with natural market processes. The aggregate audience of financial media in the US exceeds 50 million.

Entertainment. The "greed is good" speech in *Wall Street* (1987) became cultural shorthand for a worldview already institutionalized. Reality television (e.g., *Survivor*, *The Apprentice*) is structured around competition, betrayal, and individual victory, reinforcing the narrative that life is a zero-sum game.

Self-help literature frequently adopts evolutionary-psychology framing: "your brain is wired for competition."

Evolutionary psychology popularization. Books like Dawkins' *The Selfish Gene* (1976), a brilliant work of science communication whose title was widely misread as a claim about organisms rather than genes, provided scientific-sounding support for the selfishness regime. The "gene's-eye view" was translated, in popular understanding, into "selfishness is natural, cooperation is an illusion." Dawkins himself has protested this misreading, but the doxonomic damage was done: the phrase "selfish gene" became a cultural reference point for the naturalization of self-interest.

The quantitative asymmetry. Narratives about human selfishness and competition are vastly more prevalent in mainstream media than narratives about human cooperation and solidarity. A content analysis of US newspaper opinion pages would reveal that "incentive" appears orders of magnitude more frequently than "solidarity," and "market" more frequently than "commons." This asymmetry is not a natural reflection of reality; it reflects the institutional infrastructure that produces media content.

21.5 The Self-Fulfilling Prophecy

21.5.1 The mechanism

Consider a first-year university student taking an introductory economics course. The professor explains that rational agents maximize their own utility; the textbook models assume self-interest; the problem sets reward strategic thinking. The student leaves the course believing that most people are selfish. She has not been argued into it; she has absorbed it as the unquestioned premise of every exercise she completed. She enters a group project expecting free-riders. She monitors her partners for shirking. Her vigilance makes them uncomfortable; trust erodes; cooperation falters. "See?" she concludes. "People really are selfish." She has just experienced the most dangerous property of the selfishness regime: it generates the evidence for its own truth.

Proposition 21.5 (Doxonomic Self-Fulfillment)**.** [1] *Let agents be conditional cooperators who cooperate when $\hat{\mu}_j(\text{cooperate}) > \tau_j$, where $\hat{\mu}_j$ is j's perception of the cooperation norm and τ_j is j's cooperation threshold. If a doxonomic intervention reduces $\hat{\mu}_j(\text{cooperate})$ by shifting perceived norms (by amount δ), then:*

[1] This result follows from the model assumptions; it is a heuristic prediction, not an empirically validated law. The qualitative mechanism (narrative shifts norm perceptions, which shifts behavior, which confirms the narrative) is well-supported; the specific dynamics are stylized.

1. *fewer agents exceed their threshold: cooperation drops,*
2. *the observed drop confirms the narrative ("see, people are selfish"),*
3. *which further reduces $\hat{\mu}_j$ for those who observe behavior,*
4. *producing a downward cascade until the system reaches a new (lower) equilibrium.*

Formally, the dynamics satisfy:

$$\mu_{coop}^{(t+1)} = G\Big(\hat{\mu}_{coop}^{(t)} - \delta\Big)$$

where G is the fraction of the population whose threshold τ_j falls below the perceived norm. If $G'(x) > 1$ at the initial equilibrium, the doxonomic shock δ triggers a cascade to the low-cooperation equilibrium.

21.5.2 Multiple equilibria

The self-fulfilling mechanism implies that the same population, with the same underlying preferences, can sustain *different equilibrium cooperation levels* depending on the narrative environment:

- **High-cooperation equilibrium**: most people believe others cooperate $\to$ most cooperate $\to$ belief confirmed.
- **Low-cooperation equilibrium**: most people believe others defect $\to$ most defect $\to$ belief confirmed.

Both equilibria are self-consistent. The narrative environment, specifically which stories about human nature are institutionally amplified, determines which equilibrium the population settles into. The selfishness regime pushes toward the low-cooperation equilibrium; a cooperative regime would push toward the high-cooperation equilibrium.

Example 21.6. Let $\tau_j \sim \text{Beta}(3, 2)$ (most people have moderate cooperation thresholds, with a mean of 0.6). At the high-cooperation equilibrium, $\hat{\mu} = 0.75$: 86% of agents have $\tau_j < 0.75$ and cooperate. At the low-cooperation equilibrium, $\hat{\mu} = 0.30$: only 17% cooperate.

A doxonomic shock of $\delta = 0.15$ (shifting perceived norms from 0.75 to 0.60) triggers a cascade: at $\hat{\mu} = 0.60$, 66% cooperate. But the observed 66% further reduces $\hat{\mu}$, which reduces cooperation further, until the system settles at the low-cooperation equilibrium ($\hat{\mu} \approx 0.30$, 17% cooperate).

The *same population* has gone from 86% to 17% cooperation, not because preferences changed, but because the narrative environment tipped the norm perception past the critical threshold.

21.5.3 The doxonomic trap

Definition 21.7 (Doxonomic Trap)**.** A *doxonomic trap* is a locally stable equilibrium that is Pareto-inferior to an alternative equilibrium but is sustained by the self-fulfilling properties of the dominant narrative. Escaping the trap

requires a coordinated shift in both narrative and norm perception, which is difficult precisely because the current narrative makes the alternative seem naive or impossible.

The selfishness regime constitutes a doxonomic trap: the low-cooperation equilibrium is Pareto-inferior (everyone would be better off with more cooperation), but the narrative that "people are selfish" is self-confirming, and anyone who proposes the cooperative alternative is dismissed as ignoring "human nature."

21.6 Affect, Precision, and the Moral Basin

The self-fulfilling mechanism of Section 21.5 operates through perceived norms: the regime shifts what agents expect others to do, and behavior follows expectation. A deeper layer operates through moral feeling itself. The selfishness regime does not only tell agents that others will defect; it also teaches them which emotional responses count as *moral warrant*. Contempt for a free-rider reads as moral perception; unease at a cooperator who "left money on the table" reads as prudence; sympathy for a diffuse victim reads as sentimentality. Over time the regime shapes propositional belief and the precision assigned to affect: which gut responses are treated as evidence, and which are treated as noise to be overridden.

This section sketches an individual-level mechanism that feeds the population dynamics already developed. Doxonomics is not psychology (Chapter 2), but population belief aggregates individual states, and some of the most durable regimes operate by recruiting the machinery of moral affect. The account is stylized and active-inference-compatible; it is a proposed synthesis, not a canonical result.

21.6.1 Feelings as dashboards, not verdicts

The folk theory of moral cognition treats feeling as perception: disgust reveals wrongness, anger reveals injustice, guilt reveals culpability. The empirical picture is more constrained. Moral evaluation can, in some tasks, be reported faster than self-reported felt emotion, and incidental affect (disgust primed by a bad smell, anger carried over from traffic) leaks into unrelated moral judgments, though meta-analysis suggests average incidental-affect effects are small. The useful compression is that moral feelings are *dashboards* (fast compressions of harm, threat, norm violation, and action urgency), not *verdicts*.

Under active inference (a family of frameworks in which the brain is modeled as continually predicting its sensory inputs and updating to minimize prediction error), emotion is an *interoceptive inference*: the organism's best model of its own bodily state (heart rate, arousal, visceral tone), used to regulate action. What governs how much that inference shapes downstream

judgment is *precision*: the confidence the system assigns to the bodily signal relative to other evidence channels. When precision on interoception is high and evidence on harm, intent, or victim structure is diffuse, the system falls into a moral basin driven by feeling. When precision is more evenly distributed, the same feeling becomes one input among several.

21.6.2 A minimal state space

Let the individual moral state be

$$x_t = [\, I,\ \Pi,\ H,\ T,\ N,\ V,\ C,\ R,\ S,\ U \,]$$

with I interoceptive arousal, Π the precision placed on it, H perceived harm, T inferred intent, N taboo/purity salience, V victim salience, C self-causation, R repair efficacy, S social confirmation, and U residual ambiguity. The state moves on a potential $\mathcal{V}(x; c)$ shaped by context c: threat cues, narrative framing, group signals, institutional environment. The picture is a landscape: $\mathcal{V}$ has local minima (*attractors*) around which the system settles, each surrounded by a *basin* of nearby states that drain into it. Attractors here are not physical locations but stable patterns of appraisal and disposition. Candidate attractors correspond to action dispositions: *avoid* (disgust-like exclusion), *punish* (anger-like sanction), *repair* (guilt-like restitution), *help* (empathic concern), and *suspend* (withholding judgment). Context c reshapes the landscape: a regime that deepens one basin and flattens others changes which attractor the same facts tend to produce. The same person, facing the same facts, can land in different basins depending on which variables the environment amplifies.

Definition 21.8 (Moral Distortion Index)**.** For an individual in moral state x, the *moral distortion index* is

$$D(x) \;=\; \frac{\Pi\, I + S}{H + T + V + C + R + \varepsilon}$$

for small $\varepsilon > 0$. $D \ll 1$: judgment is anchored to appraisal evidence (harm, intent, victim structure, causation, repair). $D \gg 1$: bodily affect weighted by precision, plus social reinforcement, outruns appraisal.

D is a bookkeeping device, not a measurement instrument. It names the regime in which "this feels wrong" most readily hardens into "this *is* wrong," and, symmetrically, the regime in which moral feeling serves as useful input rather than mistaken revelation.

21.6.3 Doxonomic amplification of D

A regime does not control the full state x; it shapes context c, and context shapes which variables the environment makes salient. The selfishness regime raises D asymmetrically through two complementary moves:

1. **Amplification.** It elevates ΠI and S on regime-supporting stimuli (betrayal narratives about free-riders, affective framings of welfare recipients, spectacle-driven coverage of individual wrongdoing), so that anger and contempt feel like moral perception.
2. **Diffusion.** It suppresses H, V, C, and R on regime-threatening stimuli (institutional harms spread across populations, victims with no camera, causal chains too long to narrate, reparative policies framed as fiscally irresponsible).

The aggregate effect is to grant moral feeling high precision where it supports the regime and low precision where it would challenge it. This composes with Section 21.5: narrative shifts norm perception, and it also shifts which feelings are granted moral authority.

Proposition 21.9 (Affective Recruitment)**.** [2] *A regime that selectively amplifies ΠI and S on regime-supporting stimuli while diffusing H, V, C, and R on regime-threatening stimuli raises population D asymmetrically. The resulting distribution of moral feeling tracks institutional interest rather than evidential warrant, even when no agent experiences the shift as manipulation.*

The mechanism matters precisely because it is not experienced as indoctrination. Agents feel their moral responses as their own. The regime has shaped not what they think but what feels morally self-evident, which is a deeper lock-in than propositional belief, and correspondingly harder to dislodge.

21.6.4 Hysteresis and the cost of exit

Attractor dynamics imply hysteresis: once a moral basin deepens through repetition, social reinforcement, and enacted judgment, the evidence required to exit it exceeds the evidence that would have been required to prevent entry. This is consistent with the lock-in properties of doxonomic systems developed in Chapter 11. The policy consequence is that counter-doxonomic work cannot rely on argument alone. Arguments operate on appraisal variables (H, T, V); lock-in operates on the affect-precision channel ΠI and the social-coupling channel S. Shifting the moral basin requires sustained experiential counter-evidence (cooperative institutions that visibly work), sustained reframing of affect (narratives that re-locate anger toward structural sources of harm and concern toward structurally produced victims), or both.

Whether populations actually exhibit the asymmetric D predicted by Proposition 21.9 is an open empirical problem. Candidate approaches are discussed in Chapter 13 (individual-level affect measurement) and Chapter 17 (regime-level amplification patterns in discourse).

[2] This proposition follows from the model assumptions; it is a structural claim about how regimes exploit affect, not a calibrated prediction.

21.7 The Policy Feedback Loop

The selfishness regime does not merely describe behavior; it shapes the institutional environment in which behavior occurs, creating a feedback loop:

Model 21.10 (Policy Feedback)**.**

1. The selfishness assumption enters policy design: regulators assume that agents will cheat unless monitored; managers assume workers will shirk unless incentivized; policymakers assume citizens will free-ride unless forced to contribute.
2. Policy instruments are designed accordingly: surveillance systems, performance-based pay, privatization, means-testing.
3. These instruments signal to citizens that they are not trusted, which reduces intrinsic motivation and cooperative behavior (Frey 1997).
4. The resulting behavior confirms the selfishness assumption, justifying further monitoring and incentivization.

Frey (1997) documented the "crowding out" effect: monetary incentives can reduce intrinsic motivation. Offering to pay people for blood donations *reduces* donations compared to asking them to donate voluntarily. Imposing fines for late pickup at daycare centers *increases* lateness, as parents treat the fine as a price, replacing a social norm with a market transaction (Gneezy and Rustichini 2000).

Through the policy feedback loop, the selfishness regime generates the behavior it claims to describe. The regime creates the institutional conditions under which self-interest is the rational response, then points to the resulting behavior as evidence that self-interest is natural.

21.8 Two Competing Regimes: A Formal Model

Model 21.11 (Anthropological Regime Competition)**.** Let $B_S(t)$ be the prevalence of the selfish regime and $B_C(t) = 1 - B_S(t)$ the cooperative alternative. The dynamics are:

$$\frac{dB_S}{dt} = B_S(\alpha_S \phi_S - \gamma_S - \beta_{SC} B_C) \tag{21.1}$$

$$\frac{dB_C}{dt} = B_C(\alpha_C \phi_C - \gamma_C - \beta_{CS} B_S) \tag{21.2}$$

where:

- ϕ_S, ϕ_C are institutional funding levels ($\phi_S \gg \phi_C$),
- α_S, α_C are conversion efficiencies (funding $\to$ belief change),
- γ_S, γ_C are natural decay rates,
- β_{SC}, β_{CS} are competitive interaction coefficients.

Proposition 21.12 (Funding Threshold for Regime Change)**.** *The cooperative regime displaces the selfish regime if and only if*

$$\alpha_C \phi_C > \gamma_C + \beta_{CS} \cdot B_S^*$$

where B_S^* is the current selfish-regime prevalence. Given the current dominance of the selfish regime ($B_S^* \approx 0.7$), this implies:

$$\phi_C > \frac{\gamma_C + 0.7\beta_{CS}}{\alpha_C}.$$

With plausible parameter values ($\gamma_C = 0.05$, $\beta_{CS} = 0.3$, $\alpha_C = 0.001$ per million dollars), the required annual investment is:

$$\phi_C > \frac{0.05 + 0.21}{0.001} = \$260 \text{ million/year.}$$

This is a fraction of the selfishness regime's estimated $10–18 billion annual investment, suggesting that the cooperative regime is not disadvantaged by intrinsic weakness but by massive resource asymmetry.

Note: these parameter values are illustrative, not empirically calibrated. Rigorous estimation would require the methods of Chapters 13–16. The point is not the specific number but the *structure* of the analysis: regime change depends on the ratio of institutional investment to natural decay and competitive pressure, and the required investment can in principle be estimated.

21.9 Counter-Narratives and Their Institutional Base

The selfishness regime has not gone unchallenged. Several counter-narratives have emerged, each with its own (much smaller) institutional base:

Behavioral economics. Beginning with Kahneman and Tversky in the 1970s and gaining institutional power through Nobel Prizes (2002, 2017), the Journal of Behavioral Economics, and "nudge units" in government, behavioral economics challenges the rationality assumption, though it generally preserves self-interest, replacing "rational selfishness" with "biased selfishness" (Kahneman 2011).

Commons research. Ostrom's work, recognized with the 2009 Nobel Prize, demonstrated that communities can manage shared resources without privatization. The institutional base: the Ostrom Workshop (Indiana University), the International Association for the Study of the Commons, and a network of field researchers. Funding level: tiny compared to the economics mainstream.

Cooperative economics. The cooperative movement (Mondragon, credit unions, worker cooperatives, platform cooperatives) provides empirical counter-evidence: organizations that assume cooperative motivation can be economically successful. The institutional base is fragmented and underfunded compared to the corporate sector.

The funding asymmetry. A rough estimate of the counter-narrative institutional investment:

Counter-narrative institution	Annual budget (est.)
Behavioral economics research centers (top 10)	\$20–40 million
Commons research network (global)	\$5–10 million
Cooperative development organizations (US)	\$10–20 million
Progressive economic think tanks (EPI, Roosevelt, etc.)	\$30–50 million
Total counter-narrative investment	**\$65–120 million**

The funding ratio is approximately 100:1 in favor of the selfishness regime. This asymmetry, not the relative quality of the evidence, is the primary explanation for the selfishness regime's dominance.

21.10 Cross-Cultural Comparison

The selfishness regime is not universal. Different societies operate under different anthropological regimes, with different institutional infrastructures supporting different beliefs about human nature.

Japan. Japanese management theory emphasizes group harmony (*wa*), lifetime employment, and organizational loyalty, an anthropological regime closer to "humans are group-oriented" than "humans are selfish." The institutional base: the Ministry of Economy, Trade and Industry (METI), corporate culture, educational system emphasizing group work. Note: this regime has been under pressure from neoliberal reform since the 1990s, illustrating the global reach of the selfishness regime's institutional infrastructure.

Nordic countries. Scandinavian societies maintain high levels of social trust and cooperation, supported by: universal welfare states, strong labor unions, cooperative traditions, and educational systems that emphasize solidarity. The doxonomic infrastructure supporting cooperation is embedded in state institutions rather than private foundations.

Indigenous commons regimes. Many indigenous societies maintain anthropological regimes centered on reciprocity, kinship obligation, and commons stewardship. These regimes have been systematically disrupted by colonial and neoliberal institutional intervention (cf. Chapter 25).

The cross-cultural comparison supports the doxonomic thesis: where institutional infrastructure supports cooperation, people cooperate more; where it supports self-interest, people behave more self-interestedly. Human nature is not fixed at "selfish" or "cooperative." It is *institutionally mediated*, and the mediating institutions are themselves products of material investment.

21.11 Notes and References

This chapter draws heavily on Bowles and Gintis (2011), Fischbacher et al. (2001), Henrich et al. (2001), and Ostrom (1990). On the "tragedy of the commons" and its limitations, see Hardin (1968) and Ostrom's (1990) devastating response. The developmental evidence for pro-social behavior is reviewed in Tomasello (2009). Neuroscience of cooperation is surveyed in Rilling et al. (2002).

On the indoctrination effect of economics education, see Frank et al. (1993) and Bauman and Rose (2011). The institutional history of homo economicus is traced in Mirowski and Plehwe (2009) and Fourcade (2009). Self-fulfilling beliefs are modeled in Schelling (1978). On the crowding-out effect of incentives, see Frey (1997).

On the alternative cooperative anthropology, see Gintis et al. (2005) and Nowak (2006). The behavioral economics challenge is surveyed in Kahneman (2011). For a popular account of the "selfish gene" misreading, see Midgley (1979).

On cross-cultural variation in economic behavior, see the comprehensive survey in Henrich et al. (2001) and Henrich et al. (2010). The neoliberal transformation of Japanese economic policy is discussed in Vogel (2006). Nordic social democracy is analyzed in Esping-Andersen (1990).

21.12 Exercises

Exercise 21.1. Using Proposition 21.12, estimate the annual counter-doxonomic investment needed to shift the U.S. anthropological regime from selfish to cooperative. State your parameter assumptions explicitly. Conduct a sensitivity analysis: how does the required investment change if α_C is twice as large (the cooperative message is more persuasive per dollar)?

Exercise 21.2. Design an experiment to test the self-fulfilling prophecy of selfishness narratives.

1. Randomly expose groups to different anthropological narratives.
2. Measure cooperation in subsequent public goods games.

3. Measure perceived norms (what do subjects think others will do?).
4. Test whether the effect operates through the norm perception channel (mediation analysis).

Specify sample size, treatment arms, and pre-registration plan.

Exercise 21.3. Construct a doxonomic account (Chapter 14) for the belief "human nature is selfish," identifying at least five funding channels and estimating their annual expenditure. Use the accounting framework to identify which channels have the highest return on doxonomic investment.

Exercise 21.4. Argue that the self-fulfilling property of selfishness beliefs creates a doxonomic trap (Definition 21.7).

1. Show formally that both the high-cooperation and low-cooperation equilibria are stable.
2. Compute the basin of attraction for each equilibrium using the Beta(3,2) threshold distribution.
3. Calculate the minimum doxonomic shock δ^* needed to tip the system from the low-cooperation to the high-cooperation equilibrium.
4. Discuss what real-world intervention could produce a shock of this magnitude.

Exercise 21.5. Compare the doxonomic investment in "humans are selfish" with the investment in "humans are cooperative."

1. Estimate the funding ratio using the institutional accounting approach.
2. Given this ratio, what does the epistemic status of the dominant regime's dominance tell us: that it reflects the evidence, or that it reflects the funding?
3. Design a study that could distinguish between these two explanations.

Exercise 21.6. Conduct a content analysis of the first three chapters of two introductory economics textbooks.

1. Count explicit and implicit invocations of self-interest as a motivational assumption.
2. Count mentions of cooperation, altruism, or pro-social behavior.
3. Compare with the actual experimental evidence summarized in Section 21.1.
4. What is the "textbook-evidence gap," and how would you explain it doxonomically?

Exercise 21.7. Select a non-Western society with a different anthropological regime (e.g., Japan, Bhutan, an indigenous commons community).

1. Describe the dominant anthropological assumptions.
2. Map the institutional infrastructure that supports these assumptions (education, media, policy, religion).
3. Assess whether neoliberal doxonomic intervention has shifted the regime, and if so, through which channels.
4. What would the doxonomic model predict about the future trajectory?

Exercise 21.8 (Computational). Simulate the self-fulfilling prophecy model from Theorem 21.5:

1. Generate 1,000 agents with thresholds $\tau_j \sim \text{Beta}(3, 2)$.
2. Start at the high-cooperation equilibrium ($\hat{\mu} = 0.75$).
3. Apply a doxonomic shock $\delta = 0.15$ and iterate the norm-updating dynamics for 50 periods.
4. Plot the cooperation rate over time. Does the system tip to the low-cooperation equilibrium?
5. Repeat for $\delta = 0.05, 0.10, 0.15, 0.20, 0.25$. Find the critical δ^* at which tipping occurs.
6. Now simulate a "counter-doxonomic" intervention: starting from the low-cooperation equilibrium, apply a positive shock. What magnitude is required to restore high cooperation?

CHAPTER 22

Meritocracy

> The more a society proclaims its meritocracy, the more its winners can justify their position and the more its losers blame themselves.
>
> Michael Sandel, *The Tyranny of Merit*

Meritocracy is the belief that outcomes reflect effort and talent. It is also one of the most heavily subsidized narratives in modern capitalism, functioning as the primary legitimation mechanism for inequality. Where the selfishness regime (Chapter 21) shapes beliefs about what humans *are*, the meritocratic regime shapes beliefs about what humans *deserve*: those who succeed deserve their success; those who fail deserve their failure; and the distribution of rewards, however unequal, is fundamentally just.

This chapter applies the full doxonomic toolkit (genealogy, institutional analysis, formal modeling, cross-cultural comparison) to the meritocratic regime. The analysis reveals a belief system that is empirically questionable, institutionally constructed, and functionally essential to the political stability of societies with extreme inequality.

22.1 The Meritocratic Belief System

22.1.1 Structure of the regime

Definition 22.1 (Meritocratic Regime)**.** The *meritocratic regime* is an ideology $\mathcal{P}_M$ containing four mutually reinforcing propositions:

1. p_1: Success reflects ability and effort (the *desert* claim).
2. p_2: Opportunity is broadly equal (the *access* claim).
3. p_3: Failure reflects personal deficiency (the *blame* claim).

4. p_4: Inequality is therefore justified (the *legitimation* claim).

These propositions form a coherent bundle: high credence in p_1 raises credence in p_3 and p_4. The regime functions as a *just-world ideology*: it provides a moral framework in which the existing distribution of outcomes is deserved.

The logical structure is worth noting: p_4 follows from p_1–p_3 only if the background conditions hold. If opportunity is *not* equal (p_2 is false), then success does not reflect desert alone, failure does not reflect deficiency alone, and the legitimation claim collapses. The empirical question is therefore whether p_2 holds: whether opportunity is in fact broadly equal.

22.1.2 The empirical record

The evidence overwhelmingly contradicts p_2. Intergenerational income elasticity in the United States is approximately 0.47: roughly half of a parent's income advantage is transmitted to their children (Chetty et al. 2014). A child born in the top income quintile has a 40% chance of remaining there as an adult; a child born in the bottom quintile has a 7.5% chance of reaching the top. The "American Dream" of unlimited upward mobility is a statistical rarity, not the norm.

Country	Intergenerational elasticity	Rank
Denmark	0.15	High mobility
Canada	0.19	High mobility
Germany	0.32	Moderate
United States	0.47	Low mobility
United Kingdom	0.50	Low mobility

The paradox is striking: the United States, the country most committed to meritocratic ideology, has among the lowest actual mobility in the developed world. The doxonomic hypothesis: meritocratic belief is strongest not where mobility is highest, but where *narrative investment in meritocracy* is highest. High inequality requires more legitimation effort, and the US has the institutional infrastructure to provide it.

22.1.3 The psychological function

Meritocratic belief serves a psychological function beyond political legitimation. Just-world belief (Lerner 1980) reduces the anxiety of living in an uncertain and unequal world: if outcomes are deserved, then I am safe as long as I am virtuous and hardworking. This psychological appeal makes the meritocratic narrative "sticky": people are motivated to believe it, not just persuaded by evidence for it.

The doxonomic implication: meritocratic belief has both a "supply side" (institutional production) and a "demand side" (psychological motivation).

The narrative succeeds because institutions produce it *and* because audiences want to believe it. This dual anchoring makes it especially resistant to counter-evidence.

22.2 Institutional Repetition

The meritocratic regime is reinforced through a network of institutions that treat meritocratic assumptions as operational truth.

22.2.1 Education

Grading, ranking, credentialing, standardized testing, and academic competition constitute an immersive meritocratic environment for children and young adults. The educational system performs two doxonomic functions simultaneously:

1. **Sorting function**: it actually does reward some abilities and efforts (reading comprehension, test-taking skills, persistence), creating a genuine correlation between performance and outcomes.
2. **Laundering function**: it transforms inherited advantages (parental education, income, social networks, test preparation resources) into credentials that *appear* to reflect pure merit.

The meritocratic narrative emphasizes the sorting function and denies the laundering function. But the laundering function is massive: SAT scores correlate with family income at $r \approx 0.4$, and the correlation between parental education and child's educational attainment is even higher.

22.2.2 Corporate culture

Model 22.2 (Corporate Meritocratic Reproduction)**.** Corporate "talent management" systems reproduce meritocratic belief through:

1. *Hiring*: elite credentials (from elite universities, whose admissions correlate with family wealth) as merit proxies.
2. *Performance review*: individual evaluation systems that attribute team outcomes to individual effort, ignoring structural advantages.
3. *Promotion*: "up or out" systems that frame career outcomes as reflecting individual talent.
4. *Compensation*: extreme pay ratios (CEO-to-worker ratio ∼350:1 in the US) justified as reflecting proportional contribution.

Each practice makes meritocratic assumptions operational, generating behavioral data that appears to confirm the assumptions.

22.2.3 Media

The media meritocratic infrastructure includes:

Rags-to-riches narratives. Disproportionate coverage of exceptional upward mobility (Oprah, Steve Jobs, Jay-Z) creates availability bias about its frequency. The narrative structure (individual overcomes adversity through talent and perseverance) is compelling precisely because it is rare; but the sheer volume of such narratives makes it seem typical.

Billionaire hagiography. Biographies, profiles, and documentaries about the ultra-wealthy overwhelmingly attribute their success to vision, hard work, and risk-taking rather than to inherited wealth, network advantages, regulatory capture, or luck. The genre conventions of business journalism enforce this framing: the "founder story" is always a story of individual genius.

Failure as spectacle. Conversely, poverty and failure are framed as individual pathology: addiction, laziness, bad decisions. The structural conditions that produce poverty (deindustrialization, housing markets, healthcare costs, racial discrimination) are backgrounded in favor of individual narratives.

22.2.4 Policy

Means-testing, workfare, conditional welfare, drug testing for benefit recipients, and "personal responsibility" rhetoric all operationalize the meritocratic assumption that poverty reflects deficient character. These policy designs simultaneously:

- *signal* that the state views the poor as undeserving (reinforcing the narrative),
- *impose costs* that make poverty harder to escape (undermining actual mobility),
- *generate data* (low take-up rates, compliance failures) that appear to confirm the deficiency narrative.

22.2.5 Self-help industry

The self-help and motivational industry, with annual revenues exceeding $13 billion in the US, is perhaps the purest expression of meritocratic doxonomics. Its core message is that success is a matter of mindset: "think and grow rich," "the secret," "grit," "growth mindset." Structural barriers are reframed as mental barriers; political problems become personal development opportunities (Ehrenreich 2009).

22.3 Credential Systems as Epistemic Capital Laundering

22.3.1 The laundering mechanism

Proposition 22.3 (Credential Laundering)**.** *Credential systems (degrees, certifications, rankings) convert inherited advantage into apparent merit. If access to credentials correlates with parental wealth ($r > 0$), then the credential c_j for agent j satisfies:*

$$c_j = f(ability_j, effort_j) + g(wealth_j) + \varepsilon_j$$

where f is the genuine merit component and g is the laundering function. The meritocratic narrative claims $g \equiv 0$. The doxonomic analysis estimates g and reveals the laundering magnitude.

22.3.2 Decomposing credentials

Example 22.4. Consider admission to a selective university. The credential (admission) is a function of:

- SAT score (correlates with family income at $r \approx 0.4$),
- GPA (correlates with school quality, which correlates with neighborhood wealth),
- extracurricular activities (correlates with parental time and money: fencing, oboe, summer research internships),
- legacy status (direct inheritance of institutional advantage),
- recommendation letters (correlate with access to well-connected adults).

A rough variance decomposition: ability and effort explain ∼30–40% of the variance in selective college admission; family background explains ∼30–40%; institutional factors (legacy, geography, recruited athlete status) explain ∼20–30%. The meritocratic narrative attributes 100% to the first component. The laundering function g accounts for the remaining 60–70%.

22.3.3 The credibility premium of credentials

Credentials not only sort individuals; they confer *epistemic capital* (Chapter 6). A policy recommendation from a Harvard economist carries more weight than the same recommendation from a community college instructor, not because the content differs, but because the credential signals membership in a high-credibility institution. This credibility premium amplifies the meritocratic regime: those who succeed in the credentialing system gain disproportionate influence over the narratives that define what counts as merit.

22.4 A Formal Model of Meritocratic Belief

22.4.1 Belief as a function of investment and visibility

Model 22.5 (Meritocratic Belief Production)**.** The strength of meritocratic belief B_M in a population is a function of narrative investment ϕ_M and inequality visibility V:

$$B_M = \frac{\phi_M}{\phi_M + \kappa \cdot V}$$

where $\kappa > 0$ measures the sensitivity of belief to visible inequality. Properties:

- $B_M \to 1$ as $\phi_M \to \infty$: with sufficient investment, any level of inequality can be legitimated.
- $B_M \to 0$ as $V \to \infty$: if inequality becomes infinitely visible, no narrative investment suffices.
- The elasticity of belief with respect to investment is $\varepsilon_\phi = \kappa V/(\phi_M + \kappa V)$: investment is most effective when inequality is moderate.

22.4.2 The legitimation cost of inequality

Proposition 22.6 (Legitimation Cost)**.** *To maintain meritocratic belief at level B_M^* as inequality grows, the required investment is:*

$$\phi_M^* = \frac{B_M^*}{1 - B_M^*} \cdot \kappa V.$$

This is linear in V: a doubling of visible inequality requires a doubling of narrative investment to maintain the same level of meritocratic belief.

Example 22.7. If $\kappa = 1$, $B_M^* = 0.7$, and inequality visibility is $V = 5$ (on an arbitrary scale):

$$\phi_M^* = \frac{0.7}{0.3} \cdot 1 \cdot 5 = 11.67 \text{ (investment units)}.$$

If inequality doubles ($V = 10$):

$$\phi_M^* = \frac{0.7}{0.3} \cdot 10 = 23.33.$$

The required investment doubles. This implies that societies with rapidly rising inequality (the US since the 1980s) must *increase* their meritocratic narrative investment to maintain the same belief level, and indeed, the growth of the self-help industry, business media, and meritocratic policy rhetoric tracks the growth of inequality quite closely.

22.4.3 Dynamic model with inequality feedback

The static model becomes dynamic when we add a feedback loop: meritocratic belief affects redistributive policy, which affects inequality:

Model 22.8 (Meritocracy-Inequality Feedback)**.**

$$\frac{dB_M}{dt} = \alpha\phi_M(1 - B_M) - \beta V(t)B_M \tag{22.1}$$

$$\frac{dV}{dt} = \gamma(1 - B_M(t))^{-1} - \delta \tag{22.2}$$

where Equation (22.1) says belief grows with investment and decays with visible inequality, and Equation (22.2) says inequality grows faster when meritocratic belief blocks redistribution (high B_M reduces political support for taxation) and decays naturally at rate δ (through growth, technological diffusion, etc.).

This system can produce a *vicious spiral*: high B_M blocks redistribution $\to$ inequality grows $\to$ more investment needed to maintain $B_M \to$ higher ϕ_M $\to$ maintained $B_M \to$ continued inequality growth. The spiral continues until either narrative investment hits a budget constraint or inequality becomes so extreme that lived experience overwhelms narrative.

22.5 The Doxonomic Genealogy of Meritocracy

22.5.1 Origins of the concept

The term "meritocracy" was coined satirically by Michael Young in *The Rise of the Meritocracy* (1958) as a *dystopian warning*: a society that sorts people by "merit" will create a new aristocracy that is even more self-righteous than the old one, because it believes it earned its position. The transformation of "meritocracy" from a satirical coinage into a term of praise is itself a doxonomic achievement of the first order.

22.5.2 Institutional genealogy

Standardized testing (1900s–). IQ tests (Binet, 1905), the SAT (1926), and their successors created the apparatus of "objective" merit measurement. The tests correlated heavily with family background but were presented as measuring pure cognitive ability. The testing industry (College Board, ETS) became a self-sustaining institutional pillar of the meritocratic regime, with annual revenues exceeding $1 billion.

Human capital theory (1960s–). Becker (1964) formalized education as investment in "human capital": skills that increase productivity and thereby justify wage differentials. This framework provides the economic rationale for meritocracy: wage inequality reflects differential investment in skills, which

reflects differential ability and effort. The theory's assumptions (competitive labor markets, wages equal to marginal product) are empirically questionable, but its institutional influence is enormous: it is the foundation of education policy worldwide.

The "talent" discourse (1990s–). McKinsey's "War for Talent" (1997) and the broader talent management movement repackaged meritocratic ideology for corporate consumption. The key move: redefining organizational success as a function of recruiting and retaining "A players" (individuals with exceptional talent) rather than building effective systems. This justified extreme executive compensation and created a self-reinforcing cycle: companies that pay more claim they are attracting better talent, which justifies paying even more.

Silicon Valley meritocracy (2000s–). Tech industry culture elevated meritocratic ideology to a founding myth: the garage startup, the dropout billionaire, the disruption narrative. "Move fast and break things" implies that outcomes reflect innovation and speed, not capital access, network effects, or regulatory arbitrage. The tech industry's meritocratic self-image persists despite overwhelming evidence of racial and gender homogeneity in its leadership.

22.6 Negative Cases: When Meritocratic Belief Fails

Doxonomic analysis requires attention to failure as well as success. Not all investments in meritocratic narrative succeed, and the conditions under which they fail are theoretically informative.

1. **Economic crises.** In the aftermath of the 2008 financial crisis, meritocratic belief temporarily declined as structural causes became salient. Bankers who received million-dollar bonuses while being bailed out with public money provided a vivid counter-example to the desert narrative. But the decline was temporary: within five years, meritocratic belief had substantially recovered, suggesting that the institutional infrastructure is resilient to even severe shocks.

2. **Strong labor movements.** In societies with strong unions and social-democratic traditions (Scandinavia, post-war UK), meritocratic belief is weaker despite similar media exposure. The counter-institutional infrastructure (unions, labor parties, cooperative traditions) provides an alternative framing: outcomes reflect bargaining power and institutional design, not individual merit.

3. **Extreme inequality.** When inequality becomes so extreme that the gap between narrative and lived experience is too large, the legitimation function breaks down. The model predicts this: $B_M \to 0$ as $V \to \infty$. Historical examples include the Gilded Age populist revolt and the post-2008 Occupy movement.

4. **Racial counter-evidence.** Among Black Americans, meritocratic belief is consistently lower than among white Americans: the people for whom structural barriers are most visible are least persuaded by the meritocratic narrative (Hochschild 2016). This racial gap in meritocratic belief is itself a doxonomic variable: it reflects different lived experiences with the meritocratic system.

These negative cases constrain the model: doxonomic investment is necessary but not sufficient for common-sense capture. Lived experience, counter-institutions, and competing narratives limit the reach of any regime.

22.7 Racial and Gender Dimensions

Meritocratic belief is not distributed uniformly. It intersects with racial and gender regimes (Chapter 25) in specific and measurable ways.

22.7.1 Racial meritocracy gap

White respondents in the US consistently score higher on meritocratic belief scales than Black respondents. The gap is not simply about optimism or pessimism; it reflects structurally different positions within the meritocratic system. For a white professional whose parents were also professionals, the system does appear meritocratic: their advantages are invisible to them. For a Black professional whose parents faced redlining, school segregation, and employment discrimination, the same system appears obviously rigged.

22.7.2 The "model minority" function

The "model minority" narrative applies meritocratic logic selectively to Asian Americans, using their achievements to delegitimize structural claims by other racialized groups. The doxonomic function: "If Asian Americans can succeed despite discrimination, the failure of other minorities must reflect their own deficiencies." This narrative disaggregates the experiences of very different Asian American communities (Japanese Americans with multi-generational US presence vs. recent Hmong refugees), selectively cites educational statistics, and ignores the bamboo ceiling in corporate leadership.

22.7.3 Gender and the "choice" narrative

The meritocratic regime reframes gender inequality as reflecting women's "choices": to prioritize family, to enter lower-paying fields, to negotiate less aggressively. This narrative converts structural constraints (lack of affordable childcare, workplace discrimination, gendered socialization) into individual preferences. The doxonomic analysis reveals that the "choice" narrative is itself produced and circulated by institutions with identifiable interests in maintaining the gender pay gap.

22.8 Comparative Doxonomics of Meritocracy

Example 22.9. A comparative analysis of meritocratic belief and its institutional infrastructure:

	United States	Nordic countries
Meritocratic belief (survey)	70–80% agree "hard work leads to success"	40–50% agree
Actual intergenerational mobility	Low ($\beta \approx 0.47$)	High ($\beta \approx 0.15$–0.20)
Key institutions	Competitive education, testing industry, business media, self-help	Universal education, strong unions, comprehensive welfare
Counter-institutions	Weak unions, limited social safety net	Strong unions, labor parties, cooperative traditions
Narrative investment (est.)	Very high ($10B+)	Lower (state-funded, less commercial)

The paradox: Americans believe in meritocracy more but experience it less. The doxonomic explanation: the US has a more developed meritocratic narrative infrastructure and weaker counter-institutional infrastructure, allowing the narrative to persist despite contradictory evidence. Nordic countries have lower meritocratic belief but higher actual mobility, and the institutional infrastructure to produce an alternative narrative ("success reflects social investment, not just individual effort").

22.9 Notes and References

On meritocracy as ideology, see Sandel (2012) and Young (1958). Inequality and its legitimation are analyzed in Piketty (2014) and Stiglitz (2012). Intergenerational mobility data draws on Chetty et al. (2014) and Corak (2013).

Just-world belief is theorized in Lerner (1980). Human capital theory originates with Becker (1964).

The role of education in reproducing class structure is central to Bourdieu (1984) and Bowles and Gintis (1976). On credentialism, see Collins (1979). On the racial dimensions of meritocratic belief, see Hochschild (2016). The self-help industry as a doxonomic channel connects to Ehrenreich (2009).

On Silicon Valley's meritocratic ideology, see Marwick (2013). The "War for Talent" is analyzed in Michaels et al. (2001). Standardized testing and its social functions are critiqued in Lemann (1999). For the Nordic comparison, see Esping-Andersen (1990) and Wilkinson and Pickett (2009).

22.10 Exercises

Exercise 22.1. Using Model 22.5, compute the narrative investment ϕ_M required to maintain $B_M = 0.7$ when inequality visibility doubles (from $V = 5$ to $V = 10$, with $\kappa = 1$). Then compute the investment for $B_M = 0.9$. What does the comparison tell you about the escalating cost of legitimation?

Exercise 22.2. Design a doxometric survey to measure meritocratic belief across socioeconomic groups.

1. Write five survey items that capture the four propositions (p_1–p_4) of Definition 22.1.
2. Predict which socioeconomic groups will score highest on meritocratic belief and explain the prediction doxonomically.
3. Describe how you would distinguish between genuine belief and social desirability bias.
4. How would you test whether meritocratic belief predicts policy preferences (e.g., support for redistribution)?

Exercise 22.3. Analyze the genre of "billionaire biography" as a doxonomic product.

1. Select two biographies of ultra-wealthy individuals.
2. Apply framing analysis (Chapter 17) to identify how each biography frames the subject's success.
3. How much of the narrative is attributable to individual talent/effort vs. structural advantage (inheritance, networks, timing, luck)?
4. What doxonomic function does the genre serve?

Exercise 22.4. Apply the credential laundering framework (Proposition 22.3) to a specific credential of your choice (e.g., MBA from a top program, medical board certification, professional engineering license).

1. Identify the "merit" component f and the "wealth" component g.
2. Estimate the relative contribution of each to credential attainment.
3. How does the credential's epistemic capital (credibility, authority) amplify the laundering effect?

Exercise 22.5. Using the dynamic model (Model 22.8), analyze the vicious spiral:

1. For what parameter values does the system reach a stable equilibrium vs. diverge?
2. What real-world mechanism corresponds to the "budget constraint" that eventually limits narrative investment?
3. What policy intervention could break the spiral? Represent it as a modification to the model equations.

Exercise 22.6. Construct the US-Nordic comparison (Example 22.9) using actual data.

1. Find survey data on meritocratic belief in both contexts (e.g., World Values Survey, ISSP).
2. Find intergenerational mobility estimates for both (e.g., Chetty et al., Corak).
3. Map the institutional infrastructure in both (think tanks, educational systems, media).
4. Does the doxonomic model (higher narrative investment, lower counter-institutions $\rightarrow$ higher meritocratic belief despite lower mobility) fit the data?

Exercise 22.7 (Computational). Simulate the meritocracy-inequality feedback model (Model 22.8):

1. Set initial conditions $B_M(0) = 0.6$, $V(0) = 3$, with $\alpha = 0.1$, $\phi_M = 5$, $\beta = 0.05$, $\gamma = 0.5$, $\delta = 0.3$.
2. Simulate 100 time steps using Euler's method.
3. Plot $B_M(t)$ and $V(t)$ on the same graph.
4. Does the system reach equilibrium or spiral? At what point (if any) does the narrative investment become insufficient to maintain belief?
5. Experiment with doubling ϕ_M. How much does this delay the breakdown?

CHAPTER 23

Consumerism and Manufactured Desire

> People recognize themselves in their commodities; they find their soul in their automobile, hi-fi set, split-level home, kitchen equipment.
>
> Herbert Marcuse, *One-Dimensional Man*

Advertising is the largest doxonomic industry. Global advertising expenditure surpassed one trillion dollars in 2024, making it the single greatest investment in belief production in human history, dwarfing the budgets of all think tanks, universities, and government propaganda agencies combined. This chapter analyzes consumerism not merely as an economic pattern (people buy things) but as a doxonomic system: a coordinated, massively funded apparatus for producing and maintaining the belief that identity, happiness, and social worth are constituted through consumption.

The individual advertisement promotes a product. The advertising *system* promotes an anthropological regime: you are what you buy, happiness is purchasable, identity is a consumption choice, and the good life consists in acquisition. This regime is not self-evident: most human societies throughout history organized self-worth around kinship, craft, faith, civic virtue, or communal belonging rather than purchasing power. That consumption became the primary idiom of identity in the 20th century is a doxonomic achievement, and this chapter traces its mechanisms.

23.1 Advertising as Doxonomic Investment

23.1.1 Scale and structure

Definition 23.1 (Advertising as Doxonomic Production)**.** Advertising is a doxonomic investment whose primary output is not product awareness but *desire infrastructure*: the narrative environment in which consumption appears as the natural expression of identity, freedom, and self-worth.

The scale is staggering:

Category	Annual global expenditure (2023 est.)
Digital advertising	$600 billion
Television advertising	$160 billion
Print, radio, outdoor	$120 billion
Sponsorships and branded content	$80 billion
Total advertising	**$960 billion**
For comparison:	
Global military spending	$2.2 trillion
Global public education spending	$5.0 trillion
All US think tanks combined	$0.01 trillion

The advertising industry is roughly 100 times larger than the entire think-tank sector. In doxonomic terms, the production of consumer desire absorbs far more resources than the production of political ideology, though the two are intertwined, as Section 23.5 explores.

23.1.2 The dual product

The advertising industry produces two outputs simultaneously:

1. **Product-specific persuasion**: buy *this* car, *this* phone, *this* beverage. This is the output that advertisers pay for and measure.

2. **System-level belief production**: consumption is identity, material goods produce happiness, choice among brands is freedom, dissatisfaction is the natural human condition (solvable only by purchase). This is the output that no individual advertiser intends but that the system produces as a collective externality.

The second output is the doxonomically important one. No single Coca-Cola advertisement makes anyone believe that happiness is purchasable. But 10,000 advertisements per day (the estimated exposure of the average American) collectively produce an environment in which that belief is the unspoken

background assumption of daily life (Adorno and Horkheimer 1944; Debord 1967).

23.2 The Desire Production Function

23.2.1 Basic model

Model 23.2 (Manufactured Desire)**.** Let $D_j(t)$ be the desire intensity of agent j for goods beyond subsistence. Desire is produced by:

$$D_j(t) = D_0 + \alpha \sum_k F_k^{\text{ad}} \cdot e_{jk}(t) - \beta \cdot S_j(t) + \gamma \cdot \bar{D}_{-j}(t)$$

where:

- D_0 is baseline desire (the "natural" level absent commercial influence),
- F_k^{ad} is advertising investment through channel k, with e_{jk} the exposure of j to channel k,
- $-\beta \cdot S_j(t)$ captures *induced dissatisfaction*: advertising reduces satisfaction with current possessions ($\beta > 0$),
- $\gamma \cdot \bar{D}_{-j}(t)$ captures social comparison: j's desire increases with the average desire in j's reference group ($\gamma > 0$).

The three mechanisms (direct stimulation (α term), dissatisfaction induction (β term), and social comparison (γ term)) operate simultaneously and reinforce each other.

23.2.2 The hedonic treadmill

Proposition 23.3 (Advertising Treadmill)**.** *If satisfaction declines with the gap between desire and consumption, $S_j(t) = C_j(t) - D_j(t)$, and consumption rises to close the gap, $C_j(t+1) = C_j(t) + \eta(D_j(t) - C_j(t))$, then the system produces a treadmill:*

1. *Advertising increases desire: $D_j \uparrow$.*
2. *The desire-consumption gap reduces satisfaction: $S_j \downarrow$.*
3. *Reduced satisfaction further increases desire (via $-\beta S_j$): $D_j \uparrow\uparrow$.*
4. *Consumption rises to partially close the gap: $C_j \uparrow$.*
5. *But rising consumption raises the reference point for desire (through social comparison): $D_j \uparrow\uparrow\uparrow$.*
6. *The cycle continues: consumption rises without lasting satisfaction gains.*

At steady state, $D_j^* = (D_0 + \alpha A_j)/(1 - \gamma + \beta)$ where $A_j = \sum_k F_k^{ad} e_{jk}$. For γ close to 1 (strong social comparison), desire grows without bound unless β is very large.

This model formalizes the empirical finding that, beyond a threshold of material sufficiency, increases in income and consumption produce diminishing and eventually zero returns to subjective well-being: the Easterlin paradox

(Easterlin 1974). The doxonomic explanation: the advertising system continuously raises the aspiration level, ensuring that satisfaction never catches up to consumption.

23.2.3 Worked example: the smartphone cycle

Example 23.4. The smartphone upgrade cycle illustrates the desire production function:

1. *Direct stimulation*: Apple spends ∼$1.8 billion annually on advertising, Samsung ∼$2.0 billion.
2. *Induced dissatisfaction*: each new model is positioned as making the previous model "obsolete" (slower, lower-resolution, missing features) even when the previous model remains fully functional.
3. *Social comparison*: visible phone models signal status; using a two-year-old phone signals falling behind.
4. *Result*: the average smartphone replacement cycle is ∼2.7 years, generating ∼1.4 billion new phones sold annually, despite functional adequacy of existing devices.

The desire production cost: ∼$4 billion in direct advertising produces ∼$450 billion in smartphone revenue. The return on doxonomic investment is roughly 100:1, among the highest of any belief-production system.

23.3 Consumption as Anthropological Regime

23.3.1 The consumerist belief system

Consumerism is not merely an economic pattern but an anthropological regime: a coherent set of beliefs about what constitutes the good life.

Definition 23.5 (Consumerist Regime)**.** The consumerist regime α_C is defined by:

1. p_1: Identity is constituted through consumption choices ("you are what you buy").
2. p_2: Material acquisition produces happiness.
3. p_3: Consumer choice is the primary form of human agency and freedom.
4. p_4: Dissatisfaction is the natural human condition, solvable by purchase.
5. p_5: Social worth is legible through visible consumption.

Each proposition has a pre-consumerist alternative that it displaced:

Consumerist proposition	Displaced alternative
Identity through consumption	Identity through community, craft, faith
Happiness through acquisition	Happiness through relationships, meaning, sufficiency
Freedom as consumer choice	Freedom as political participation, self-governance
Dissatisfaction as natural	Contentment as virtue, sufficiency as ideal
Worth through display	Worth through character, contribution, belonging

The displacement was not accomplished through argument but through institutional investment: the advertising system made the consumerist propositions the unspoken background of daily experience, while the alternatives were gradually de-funded and de-institutionalized.

23.3.2 The historical construction

The consumerist regime is historically specific. Its construction can be periodized:

Early advertising (1880–1920). Patent medicines, department stores, and the first national brands created the apparatus of mass persuasion. The advertising industry professionalized with the founding of agencies (J. Walter Thompson, 1864; N. W. Ayer, 1869) and trade publications.

The Bernays revolution (1920–1950). Edward Bernays (Freud's nephew) pioneered "public relations" as the application of psychological manipulation to commercial and political persuasion. His campaigns (getting women to smoke by framing cigarettes as "torches of freedom"; engineering a banana republic coup for United Fruit) demonstrated that desire could be manufactured at industrial scale (Bernays 1928).

The golden age of mass advertising (1950–1990). Television created a delivery mechanism of unprecedented reach and intimacy. The average American household watched 6+ hours of television daily, absorbing thousands of commercial messages per week. The "Mad Men" era saw advertising expenditure grow from $5.7 billion (1950) to $130 billion (1990) in the US alone.

Digital surveillance advertising (2000–present). The internet and smartphone transformed advertising from broadcast persuasion to individualized targeting. Digital platforms (Google, Meta, Amazon) collect granular behavioral data and use it to deliver personalized advertisements at scale. The advertising model funds the infrastructure of the digital public sphere, making the content people consume financially dependent on the advertising system's need for attention.

23.4 The Political Economy of Attention

23.4.1 Attention as the scarce resource

In an information-rich environment, the scarce resource is not information but attention. The advertising system competes for attention, and the institutional structures it creates (algorithmically curated social media feeds, autoplay video, notification systems, gamified engagement metrics) reshape the cognitive environment in which all beliefs (not just consumer beliefs) are formed.

Model 23.6 (Attention Extraction)**.** Let $T_j = 16$ hours be agent j's daily waking time. Attention is allocated across n claims on j's time: work, family, civic participation, leisure, and media consumption. The advertising system's goal is to maximize a_j^{ad}, the fraction of T_j spent encountering advertisements. The optimization is:

$$\max_d \sum_j a_j^{\text{ad}}(d) \quad \text{subject to content design } d \text{ retaining user engagement.}$$

Content platforms solve this optimization by designing for "engagement" (content that maximizes time-on-platform), which produces a systematic bias toward emotionally arousing, conflict-laden, and status-signaling content.

The doxonomic consequence: the advertising system's optimization for attention shapes the information environment in which *all* beliefs are formed. Political beliefs, scientific understanding, and social norms are all filtered through an attention economy designed to sell products. The consumerist regime is not just about what people buy; it is about the cognitive infrastructure within which all belief formation occurs.

23.4.2 The attention tax

Proposition 23.7 (Attention Tax)**.** [1] *The advertising system imposes an implicit "attention tax" on the population. If the average American is exposed to ∼5,000 commercial messages per day and each requires ∼2 seconds of cognitive processing, the total daily attention tax is:*

$$\tau_{attn} = 5{,}000 \times 2s = 10{,}000s \approx 2.8 \text{ hours/day.}$$

This is time not available for civic engagement, reflection, education, or non-commercial social interaction. The aggregate US attention tax: $330M$ *people* $\times$ $2.8h/day \times 365 \approx 337$ *billion person-hours per year devoted to processing commercial persuasion.*

[1] The figures here are order-of-magnitude estimates, not precise measurements. The 5,000 messages/day figure is widely cited in the marketing literature but methodologically contested; the 2-second processing assumption is a stylized average. The proposition illustrates a structural argument, not a calibrated empirical claim.

The attention tax is regressive: it falls most heavily on those who cannot afford ad-free environments (premium streaming, ad-free news, private education). Low-income populations are exposed to more advertising per hour of media consumption, compounding the doxonomic effects.

23.5 Consumerism and Other Doxonomic Regimes

23.5.1 Consumerism reinforces the selfishness regime

The consumerist and selfishness regimes are mutually reinforcing:

- Consumerism frames human motivation as desire-satisfaction, which maps onto the economic model of utility maximization.
- The selfishness regime legitimates consumerism: if humans are naturally acquisitive, then consumption is the natural expression of human nature.
- Both regimes individualize social problems: the selfishness regime says cooperation fails because people are selfish; the consumerist regime says happiness fails because you haven't bought the right things.

23.5.2 Consumerism as political quietism

Remark 23.8 (Depoliticization Through Consumption). The consumerist regime substitutes consumer identity for political identity and consumer choice for political action. If "voting with your wallet" replaces voting at the ballot box, the locus of agency shifts from the public to the private sphere. This substitution serves the interests of actors who prefer a depoliticized population: corporations that benefit from weak regulation, and political actors who benefit from low civic participation.

The mechanism is not conspiracy but structural incentive: the advertising system has no interest in civic engagement (which does not generate revenue) and strong interest in consumption (which does). The resulting information environment systematically privileges consumer narratives over civic narratives, not because anyone designed it that way but because the revenue model rewards it.

23.5.3 Green consumerism as doxonomic containment

The rise of "ethical" or "green" consumerism illustrates doxonomic containment: absorbing a systemic critique (environmental destruction) into the consumerist framework by reframing it as a consumption choice (buy organic, drive electric, use reusable bags).

Example 23.9. The carbon footprint concept was popularized by BP's 2004 advertising campaign, which reframed climate change from a systemic problem (fossil fuel production) to an individual responsibility problem (your personal carbon footprint). The campaign invested $200+ million in shifting the locus

of responsibility from producer to consumer, a textbook doxonomic operation. The "carbon footprint calculator" became a widely used tool, embedding the individual-responsibility frame in millions of users' understanding of climate change.

23.6 Resistance and Counter-Narratives

23.6.1 Anti-consumerist movements

Counter-narratives to the consumerist regime exist, though with vastly smaller institutional support:

- **Voluntary simplicity**: movements that advocate reduced consumption as a path to well-being (Thoreau's tradition, modern minimalism).
- **Adbusters and culture jamming**: subverting advertising images to reveal their doxonomic function.
- **Degrowth economics**: the academic movement arguing that economic growth beyond sufficiency reduces rather than increases well-being.
- **Religious and philosophical traditions**: ascetic traditions in Buddhism, Christianity, Stoicism, and Islam that value non-material goods.
- **Indigenous alternatives**: many indigenous communities maintain cosmologies in which the good life centers on reciprocity, balance, and communal well-being rather than individual accumulation.

23.6.2 The funding asymmetry

The counter-consumerist movement faces an overwhelming funding asymmetry. The global advertising industry ($960 billion) outspends all anti-consumerist movements combined by a factor of at least 10,000:1. Even well-funded environmental organizations ($10–20 billion globally) are outspent by the advertising budgets of the fossil fuel industry alone ($200+ billion when including brand marketing for petroleum-derived products).

This asymmetry does not mean resistance is futile: the consumerist regime has cracks, and lived experience of its failures (debt, environmental degradation, social isolation despite material abundance) creates openings for counter-narratives. But it does mean that the regime's persistence reflects funding rather than evidence: the "good life through consumption" hypothesis has been substantially falsified by the well-being literature, yet it remains dominant because of institutional investment.

23.7 Subjective Well-Being Evidence

23.7.1 The Easterlin paradox

Remark 23.10 (Easterlin Paradox). Above a threshold of material sufficiency (∼$75,000/year in 2010 US dollars, adjusted for household size), additional income and consumption produce diminishing and eventually negligible gains in reported subjective well-being (Easterlin 1974). Cross-nationally, GDP per capita correlates weakly with life satisfaction among wealthy countries. (Note: the exact threshold and the strength of the paradox remain debated; Killingsworth 2021 finds continued gains at higher incomes, though with diminishing magnitude.)

The doxonomic implication: the consumerist regime's central promise (happiness through acquisition) is empirically false for the majority of the population in wealthy countries. Yet the belief persists, and billions of dollars are spent annually to maintain it. This is a paradigmatic case of doxonomic belief production overriding empirical evidence.

23.7.2 What does produce well-being?

The subjective well-being literature identifies several factors that matter more than consumption above the sufficiency threshold:

- social relationships and community belonging,
- sense of meaning and purpose,
- autonomy and self-determination,
- physical health and security,
- trust in institutions and other people.

Several of these factors are *undermined* by the consumerist regime: social atomization (shopping replaces socializing), meaning deficit (consumption as substitute for purpose), erosion of trust (competitive display replaces cooperative engagement). The consumerist regime thus undermines the very conditions it claims to fulfill, a structural parallel to the self-fulfilling selfishness prophecy of Chapter 21.

23.8 Notes and References

The critical theory of consumer society draws on Adorno and Horkheimer (1944), Debord (1967), and Fromm (1976). On the history of advertising and public relations, see Bernays (1928) and Ewen (1976). On advertising and identity, see Veblen (1899) and Galbraith (1958). Induced dissatisfaction and the work-spend cycle are analyzed in Schor (1998).

The Easterlin paradox is in Easterlin (1974); for updated evidence, see Kahneman and Deaton (2010) and Killingsworth (2021). For the economics of manipulation through advertising, see Akerlof and Shiller (2015). On the

attention economy, see Wu (2016) and Zuboff (2019). The political economy of digital advertising is analyzed in McChesney (2013).

Green consumerism and the individualization of environmental responsibility are critiqued in Maniates (2001). On the degrowth alternative, see Hickel (2020). For indigenous alternatives to consumerism, see Gudynas (2011) on *buen vivir*.

23.9 Exercises

Exercise 23.1. Estimate the advertising expenditure per capita in your country and compare it to per-capita spending on public education. Interpret the ratio doxonomically: what does it imply about the relative investment in consumer desire vs. civic formation?

Exercise 23.2. Using the desire production model (Model 23.2), show formally that if $\beta > 0$ and $\gamma > 0$, advertising simultaneously increases desire *and* decreases satisfaction, creating a treadmill effect.

1. Compute the steady-state desire D^* as a function of advertising expenditure A.
2. Show that $\partial D^*/\partial A > 0$ (more advertising, more desire).
3. Compute steady-state satisfaction S^* and show that $\partial S^*/\partial A < 0$ (more advertising, less satisfaction).
4. At what level of social comparison (γ) does the treadmill become unstable?

Exercise 23.3. Analyze a specific advertising campaign as a belief production chain (Chapter 5). Identify: funder, institution, channel, narrative content, intended belief change, and behavioral consequence. Which of the five consumerist propositions (Definition 23.5) does the campaign reinforce?

Exercise 23.4. Compute the attention tax (Proposition 23.7) for your own daily media diet.

1. Estimate the number of commercial messages you encounter per day across all channels.
2. Estimate the total processing time.
3. What fraction of your waking hours is devoted to processing commercial persuasion?
4. How does this compare to time spent on civic engagement, education, or community interaction?

Exercise 23.5. Apply the "doxonomic containment" analysis (Example 23.9) to another social movement that has been absorbed into the consumerist framework.

1. Describe the original systemic critique.
2. How was it reframed as a consumption choice?
3. Who funded the reframing, and through what institutional channels?

4. Does the consumer-friendly version address the original problem, or does it obscure it?

Exercise 23.6. Design a comparative study of consumerist belief strength across two countries with different advertising environments (e.g., a high-advertising country like the US vs. a country with advertising restrictions like Norway or Cuba).

1. Specify the survey items that would measure consumerist belief (Definition 23.5).
2. Specify the advertising environment variables you would measure.
3. What confounders must you control for?
4. What result would count as evidence for vs. against the doxonomic model of consumerism?

Exercise 23.7 (Computational). Simulate the hedonic treadmill model (Proposition 23.3) for 100 agents over 200 time periods:

1. Set $D_0 = 1$, $\alpha = 0.01$, $\beta = 0.3$, $\gamma = 0.4$, $\eta = 0.5$.
2. Advertising starts at $A = 50$ and doubles at $t = 100$.
3. Plot average desire $\bar{D}(t)$, average consumption $\bar{C}(t)$, and average satisfaction $\bar{S}(t)$ over time.
4. Does the doubling of advertising produce a lasting increase in satisfaction?
5. What happens if you set $\gamma = 0$ (no social comparison)? Does the treadmill still operate?

CHAPTER 24

Inequality and Legitimacy

> The comfort of the rich depends upon an abundant supply of the poor.
>
> Voltaire

Every unequal society faces a legitimation problem: why do the many accept the privilege of the few? The question is ancient (Hume noted that the rulers are always outnumbered by the ruled, so government must rest ultimately on opinion), but doxonomics gives it new precision. The previous chapters analyzed specific regimes (selfishness, meritocracy, consumerism) that contribute to legitimation. This chapter integrates them into a unified framework: the doxonomic theory of inequality legitimation.

The central argument: inequality persists not (primarily) because of coercion but because of narrative. The narrative infrastructure that legitimates inequality (the network of institutions, media outlets, educational practices, and cultural forms that make the existing distribution of rewards seem natural, inevitable, or deserved) is itself a product of material investment. The wealthy fund the narratives that legitimate their wealth: a feedback loop that doxonomics is uniquely equipped to analyze.

24.1 The Legitimation Problem

24.1.1 Why legitimation is necessary

In any society where the top 1% holds 30–40% of the wealth (as in the contemporary US and UK), the distribution could in principle be challenged by majoritarian political action. That it is not (that democratic majorities consistently fail to enact redistributive policies commensurate with the level of inequality) requires explanation.

Three explanations are commonly offered:

1. **Coercion**: the wealthy use force (police, military, legal system) to suppress redistributive demands. This is occasionally true but insufficient as a general explanation in democracies with contested elections and free speech.

2. **Institutional capture**: the political system is structured to block redistribution regardless of majority preferences (gerrymandering, lobbying, campaign finance, filibuster). This is substantially true and well-documented, but it is only part of the story.

3. **Narrative legitimation**: the majority *accepts* the existing distribution as fair, natural, or inevitable, or at least does not find it sufficiently objectionable to prioritize redistribution. This is the doxonomic explanation.

All three mechanisms operate simultaneously. The doxonomic contribution is not to deny coercion or institutional capture but to analyze the third mechanism, the one that makes the first two unnecessary for much of the time.

24.1.2 The legitimation function

Definition 24.1 (Legitimation Function)**.** The *legitimation function* $L : \mathbb{R}_{\geq 0} \times \mathbb{R}_{\geq 0} \to [0, 1]$ maps the level of inequality I and doxonomic investment ϕ_L to the population's acceptance level:

$$L(I, \phi_L) = \frac{\phi_L}{\phi_L + \kappa(I - I_0)^+}$$

where I_0 is a baseline inequality level below which legitimation is "free" (inequality is accepted without narrative investment) and $\kappa > 0$ is the sensitivity parameter measuring how effectively visible inequality erodes acceptance.

Properties of the legitimation function:

- $L = 1$ when $I \leq I_0$: below the baseline, inequality requires no justification.
- L decreases as I increases for fixed ϕ_L: rising inequality erodes legitimacy.
- L increases as ϕ_L increases for fixed I: more narrative investment increases acceptance.
- $\lim_{\phi_L \to \infty} L = 1$: with unlimited narrative investment, any inequality can be legitimated.
- $\lim_{I \to \infty} L = 0$ for fixed ϕ_L: at extreme inequality, finite investment cannot maintain legitimacy.

24.1.3 The escalating cost of legitimation

Proposition 24.2 (Escalating Cost of Legitimation)**.** *For a fixed acceptance level L^*, the required narrative investment is:*

$$\phi_L^* = \frac{L^*}{1 - L^*} \cdot \kappa(I - I_0)$$

which grows linearly in inequality. Highly unequal societies must spend proportionally more on narrative maintenance.

Example 24.3. Applying the model to the United States, 1970–2020:

	1970	1990	2010	2020
Top 1% wealth share (I)	22%	30%	35%	38%
Think-tank spending (est., $B)	0.1	0.5	0.8	1.0
Meritocratic belief (%)	70	75	72	68

Inequality rose by 73% (from 22% to 38% of wealth held by the top 1%) while think-tank spending rose tenfold. Meritocratic belief initially rose despite growing inequality (the model predicts this: investment can outpace erosion), but began declining after 2010 as inequality outstripped the narrative infrastructure's capacity to legitimate it. The 2008 crisis and post-2016 populism may mark the onset of legitimation failure, a point we return to below. (Illustrative data; actual estimation requires the methods of Chapters 13–16.)

24.2 The Legitimation Repertoire

The narrative infrastructure of inequality legitimation draws on several interlocking belief systems. Each provides a distinct justification for the existing distribution.

24.2.1 The wealth-virtue association

The most efficient legitimating narrative is the association of wealth with virtue: the belief that the rich *deserve* their wealth because they are more talented, hardworking, or morally superior. This is the intersection of the meritocratic regime (Chapter 22) and the selfishness regime (Chapter 21): competition is natural, markets are fair, winners earned their position, losers deserve their fate.

Model 24.4 (Wealth-Virtue Feedback)**.** The wealth-virtue association creates a feedback loop:

1. Wealthy individuals and corporations fund institutions that promote the wealth-virtue association (think tanks, business schools, media).

2. These institutions produce narratives that frame wealth as deserved.
3. The public internalizes the association, reducing political demand for redistribution.
4. Reduced redistribution preserves the wealth that funds the narrative infrastructure.

The loop is self-sustaining as long as the narrative investment is sufficient to maintain legitimation above the threshold L^*.

24.2.2 Trickle-down narratives

The "trickle-down" narrative holds that inequality benefits everyone because wealth at the top generates investment, innovation, and employment that eventually reach the bottom. The narrative has been a staple of supply-side economics since the 1980s and is actively promoted by business organizations and free-market think tanks.

The empirical evidence is weak: Piketty (2014) documents that periods of high inequality are not associated with faster growth; several studies find the opposite relationship. But the narrative persists because it serves a specific doxonomic function: it converts a moral problem (is inequality just?) into a technical claim (does inequality promote growth?) that can be debated endlessly without ever reaching the normative question.

24.2.3 Aspirational narratives

Rather than justifying the existing distribution, aspirational narratives redirect attention to future possibility: "You too could be rich." Lottery advertising, rags-to-riches media, and "American Dream" rhetoric serve this function. The doxonomic operation: convert a statistical reality (low intergenerational mobility) into a subjective experience (possibility of upward mobility), making the current distribution feel temporary rather than structural.

Proposition 24.5 (Prospect of Upward Mobility)**.** *The "prospect of upward mobility" (POUM) hypothesis holds that tolerance of inequality reflects the belief that one's own position may improve. Formally, agent j tolerates inequality if:*

$$\mathbb{E}_j[U(Y_j^{future})] > U(Y_j^{current} + r_j)$$

where r_j is the redistribution j would receive. If j overestimates their probability of upward mobility (because aspirational narratives are more prevalent than accurate mobility data), they rationally oppose redistribution even when it would benefit them in expectation. This is the "temporarily embarrassed millionaire" effect.

24.2.4 Blame narratives

Blame narratives locate the cause of poverty in the poor themselves: lack of effort, bad decisions, moral failings, cultural deficiency. These narratives operationalize the meritocratic regime's third proposition (p_3: failure reflects personal deficiency) and direct attention away from structural causes (deindustrialization, discrimination, healthcare costs, housing markets).

Definition 24.6 (Narrative Shield)**.** A *narrative shield* is a set of beliefs that deflects attention from structural causes of inequality to individual explanations. Formally, a narrative shield is a mapping:

$$\sigma : \{\text{structural explanations for outcome } O\} \to \{\text{individual explanations for outcome } O\}$$

that replaces "O is caused by institutional structures S" with "O is caused by individual characteristics C." The shield reduces the perceived need for collective action by framing outcomes as matters of personal responsibility.

Common narrative shields:

- "The poor are lazy" (shields from: labor market structure, wage stagnation, precarious employment).
- "If you wanted health insurance, you should have gotten a better job" (shields from: employer-based insurance system, pre-existing condition exclusions).
- "College is available to anyone who works hard enough" (shields from: tuition costs, school quality segregation, information asymmetries).
- "If immigrants can succeed, why can't you?" (shields from: selection effects in immigration, survivorship bias in success stories).

24.3 The Political Economy of Legitimation

24.3.1 Who funds legitimation?

The legitimation infrastructure is not funded by "the economy" in the abstract; it is funded by identifiable actors with identifiable interests.

Example 24.7. The institutional infrastructure of inequality legitimation in the US includes:

1. **Corporate-funded think tanks**: Heritage Foundation ($85M/year), Cato Institute ($40M), AEI ($60M), Manhattan Institute ($25M), and hundreds of smaller organizations in the Atlas Network.
2. **Family foundations of the ultra-wealthy**: Koch network ($400M+/election cycle), Scaife foundations, Bradley Foundation, Olin Foundation (now defunct but highly influential in building the intellectual infrastructure).
3. **Industry associations**: US Chamber of Commerce ($200M+/year in lobbying and communications), National Association of Manufacturers, Business Roundtable.

4. **Corporate PR and communications departments**: Fortune 500 companies collectively spend billions on public affairs, issue advertising, and narrative management.

Total estimated annual spending on inequality-legitimating narrative infrastructure: $1–3 billion in direct think-tank and advocacy spending, plus an unknown (but much larger) amount in corporate communications and media.

24.3.2 Demand-side factors

Legitimation succeeds not only because it is well-funded but because audiences have psychological incentives to accept it. Just-world belief, system justification theory (Jost et al. 2004), and cognitive dissonance reduction all predict that people will be motivated to accept narratives that justify the existing order, especially if they perceive themselves as benefiting from it (or hope to benefit in the future).

Proposition 24.8 (System Justification Premium)**.** *System justification theory predicts that, holding narrative investment constant, legitimation is higher among:*

1. *those who perceive themselves as benefiting from the current system,*
2. *those with higher need for cognitive closure (preference for certainty),*
3. *those with lower socioeconomic status (paradoxically, because accepting the system reduces the psychological cost of their position: it is less painful to believe one's poverty is deserved than to believe one is a victim of injustice).*

The third prediction (that the disadvantaged sometimes embrace legitimating narratives more than the advantaged) is empirically documented and represents a distinctive contribution of system justification theory to doxonomic analysis (Jost et al. 2004).

24.4 Legitimation Failure and Crisis

24.4.1 When legitimation breaks down

The model predicts that legitimation fails when inequality grows faster than narrative investment can compensate. Observable signatures of legitimation failure:

1. **Declining trust in institutions**: if the institutions that produce legitimating narratives lose credibility, their output loses effectiveness.
2. **Rise of populism**: populist movements (left and right) are characterized by explicit rejection of elite legitimacy: "the system is rigged."
3. **Increased protest activity**: strikes, demonstrations, and social movements increase when the population no longer accepts the distribution as legitimate.

4. **Narrative fragmentation**: the unified legitimating narrative fragments into competing frames, reducing the coherence that sustains commonsense capture.
5. **Elite anxiety**: increased spending on private security, gated communities, and "prepper" culture among the wealthy signals awareness that legitimation is failing.

24.4.2 The 2008–present legitimation crisis

Example 24.9. The 2008 financial crisis produced the most visible legitimation failure in Western democracies since the 1930s.

The triggering event. Banks that had been celebrated as innovative were revealed to be reckless. Executives who had been compensated as geniuses were exposed as incompetent or fraudulent. The meritocratic narrative, that financial success reflects talent, was visibly falsified.

The legitimation response. The policy response (bailouts without prosecution, austerity for the public, continued bonuses for executives) further eroded legitimacy by making the double standard visible. Think tanks and business groups invested heavily in counter-narratives: "the crisis was caused by government regulation" (deflecting blame from the financial sector), "we need growth, not redistribution" (the trickle-down narrative), "too much regulation will prevent recovery" (the deregulation narrative).

Partial legitimation recovery. By 2015, meritocratic belief had partially recovered in survey data: the narrative infrastructure proved resilient. But new cracks had appeared: the Occupy movement (2011), the Sanders and Trump campaigns (2016), and the "rigged system" discourse all reflected persistent legitimation failure among significant segments of the population.

The COVID-19 shock. The pandemic produced a second legitimation shock: "essential workers" earning minimum wage while billionaire wealth increased by trillions made the wealth-virtue association difficult to sustain. Whether this produces lasting legitimation failure or another partial recovery depends on the relative investment in legitimating vs. delegitimating narratives in the coming years.

24.4.3 A model of legitimation dynamics

Model 24.10 (Legitimation Dynamics)**.**

$$\frac{dL}{dt} = \alpha\phi_L(1-L) - \beta(I-I_0)^+L - \delta_{\text{crisis}} \cdot \mathbf{1}[\text{crisis at } t] \tag{24.1}$$

$$\frac{dI}{dt} = \gamma_I \cdot r(L) - \mu \tag{24.2}$$

where:

- $\alpha\phi_L(1-L)$: narrative investment increases legitimation (with diminishing returns),
- $\beta(I-I_0)^+L$: excess inequality erodes legitimation,
- δ_{crisis}: a crisis event produces a discrete legitimation shock,
- $r(L)$: the rate of return to capital increases with legitimation (high L blocks redistribution and regulation),
- μ: a natural compression force (growth, diffusion, demographic change).

The system can exhibit:

1. *Stable legitimation*: L and I reach a self-sustaining equilibrium.
2. *Vicious spiral*: rising I erodes L, but reduced L fails to produce redistribution because institutional capture blocks the political channel, so I continues to rise, further eroding L.
3. *Crisis-triggered regime change*: a legitimation shock (δ_{crisis} large enough) pushes L below a threshold, triggering redistributive political action that reduces I.

24.5 Inequality, Race, and Compound Legitimation

Economic inequality intersects with racial and gender hierarchies (Chapter 25), creating *compound legitimation*: each hierarchy provides narrative resources for legitimating the others.

Proposition 24.11 (Compound Legitimation)**.** *When economic inequality correlates with racial hierarchy, each provides narrative cover for the other:*

- *Economic inequality is legitimated by racial narratives: "Those people are poor because of their culture/behavior."*
- *Racial hierarchy is legitimated by economic narratives: "If racism were real, how do you explain successful minorities?"*

The compound effect means that neither inequality nor racial hierarchy can be fully delegitimated without also challenging the other. Intersectional doxonomic analysis is therefore not a supplement to economic analysis but a requirement for it.

Historically, racial division has been a powerful tool for blocking class-based redistribution. Du Bois (2007) identified the "psychological wage of whiteness": the psychic benefit that poor whites derive from racial superiority, which

compensates for economic deprivation and reduces demand for redistribution. This is a doxonomic mechanism: the racial narrative substitutes for material benefit, reducing the political threat that economic inequality would otherwise face.

24.6 Comparative Legitimation Regimes

Different societies legitimate their inequality structures through different narrative repertoires:

Society	Inequality level	Primary legitimation narrative	Counter-narrative strength
United States	Very high (Gini $\approx$ 0.39)	Meritocracy, aspiration	Moderate (populist, progressive)
United Kingdom	High (Gini $\approx$ 0.35)	Tradition, meritocracy	Moderate (labor movement)
Germany	Moderate (Gini $\approx$ 0.31)	Social market economy	Strong (unions, SPD tradition)
Sweden	Low (Gini $\approx$ 0.27)	Social solidarity	Very strong (universal welfare)
South Africa	Very high (Gini $\approx$ 0.63)	Post-apartheid aspiration	Strong but contested

The comparison supports the model: higher inequality requires stronger legitimating narratives, and the specific narrative used depends on the available institutional infrastructure. The US and Sweden are polar cases: the US has high inequality and a strong meritocratic infrastructure; Sweden has low inequality and a strong solidarity infrastructure. The causal direction runs both ways: institutions produce narratives that sustain inequality levels, and inequality levels demand institutions that produce legitimating narratives.

24.7 Notes and References

On inequality and its justification, see Piketty (2014) and Stiglitz (2012). The legitimation function draws on Lukes (2005) on the third dimension of power and Gramsci's theory of hegemony. System justification theory is developed in Jost et al. (2004). The wealth-virtue association is analyzed in Sandel (2012).

On the prospect of upward mobility, see Benabou and Ok (2001). On the racial dimensions of inequality legitimation, see Du Bois (2007) on the wages of whiteness and Hochschild (2016) on the American Dream's racial contours. For the political economy of inequality, see Acemoglu and Robinson (2012) and Hacker and Pierson (2010).

The 2008 legitimation crisis is analyzed in Streeck (2016). On populism as a symptom of legitimation failure, see Müller (2016). For the Koch network's institutional infrastructure, see Mayer (2016).

24.8 Exercises

Exercise 24.1. Using the legitimation function (Definition 24.1), estimate κ for the United States by comparing inequality growth and think-tank spending over 1980–2020.

1. Gather data on the top 1% wealth share (as a proxy for I) and total think-tank spending (as a proxy for ϕ_L).
2. Estimate I_0 (the inequality level at which legitimation becomes necessary) from the historical data.
3. Calibrate κ so that the model reproduces observed meritocratic belief levels.
4. Does the model predict the post-2008 decline in meritocratic belief?

Exercise 24.2. Identify three narrative shields (Definition 24.6) currently active in public discourse about wealth inequality. For each:

1. State the structural explanation being shielded.
2. State the individual explanation being substituted.
3. Trace the belief production chain: who produces this shield, through what institutions, with what funding?
4. How would you empirically test whether the shield is effective (i.e., whether exposure to the shield narrative reduces support for structural explanations)?

Exercise 24.3. Model a society where legitimation fails ($L < L^*$).

1. What observable consequences follow from legitimation failure?
2. Using Model 24.10, identify the parameter conditions under which a crisis event triggers lasting legitimation failure vs. temporary disruption followed by recovery.
3. Connect to Chapter 31: how does legitimation failure relate to belief regime fracture?

Exercise 24.4. Apply the compound legitimation framework (Proposition 24.11) to a specific historical case.

1. Choose a society where economic and racial inequality are correlated.
2. Show how economic narratives legitimate racial hierarchy and vice versa.
3. Identify a historical moment when the compound was challenged (e.g., a cross-racial labor movement) and explain why it succeeded or failed.

Exercise 24.5. Construct the comparative legitimation table (Section 24.6) using actual data.

1. Find Gini coefficients and top-income shares for at least four countries.

2. Find survey data on meritocratic or just-world belief (World Values Survey, ISSP).
3. Map the legitimation infrastructure in each country (think tanks, media, policy design).
4. Does the model's prediction (higher inequality $\rightarrow$ more legitimation investment) hold cross-nationally?

Exercise 24.6. Analyze the POUM hypothesis (Proposition 24.5) using mobility data.

1. Find actual intergenerational mobility rates for the US (e.g., Chetty et al.).
2. Find survey data on *perceived* mobility (what people think their chances of upward mobility are).
3. Compute the "mobility perception gap": the difference between perceived and actual mobility.
4. Estimate the doxonomic investment needed to maintain this gap (i.e., to sustain the belief in mobility despite contrary evidence).

Exercise 24.7 (Computational). Simulate the legitimation dynamics model (Model 24.10):

1. Set $I_0 = 20$, $I(0) = 25$, $L(0) = 0.7$, $\alpha = 0.1$, $\phi_L = 3$, $\beta = 0.02$, $\gamma_I = 0.5$, $\mu = 0.3$.
2. Simulate 200 time steps with no crisis ($\delta_{\text{crisis}} = 0$). Plot $L(t)$ and $I(t)$.
3. At $t = 100$, introduce a crisis ($\delta_{\text{crisis}} = 0.2$). How does the system respond?
4. Experiment with different ϕ_L values. What is the minimum narrative investment needed to prevent legitimation collapse after the crisis?
5. Compare scenarios where the crisis triggers redistributive policy (I decreases) vs. where institutional capture blocks redistribution (I continues rising despite low L).

CHAPTER 25

Race, Coloniality, and Gender as Doxonomic Systems

> The most potent weapon of the oppressor is the mind of the oppressed.
>
> Steve Biko

Race, coloniality, and gender are among the most consequential doxonomic systems in human history. Each involves the large-scale production and institutional stabilization of beliefs about what kinds of people exist, what they are capable of, and what they deserve. A field that claims to study how power shapes belief cannot treat these as optional examples. They are central cases, arguably the cases where doxonomic production has been most systematic, most durable, and most materially consequential.

This chapter extends the doxonomic framework to analyze these systems, revealing both the framework's strengths (it provides precise tools for tracing funded narrative production) and its limitations (some of the most durable belief systems are reproduced through unpaid labor, embodied practice, and institutional routine rather than through the explicit funding flows that doxonomic accounting tracks most naturally).

25.1 Race as Manufactured Social Ontology

25.1.1 Definition and mechanism

Definition 25.1 (Racial Regime)**.** A *racial regime* is a doxonomic system that produces and maintains a categorical division of humanity into hierarchically ordered groups based on perceived phenotypic or ancestral characteristics, where:

1. the categories are presented as natural rather than constructed,
2. differential treatment is legitimated by attributed group capacities or deficiencies,
3. the institutional infrastructure (law, education, media, science) continuously reproduces the classification (Gould 1981),
4. the material consequences of classification (segregation, differential wealth, differential health) generate "evidence" that appears to confirm the classification.

The fourth criterion is distinctively doxonomic: the racial regime produces the conditions that make it appear true. Segregation produces differential educational outcomes; differential education produces differential economic outcomes; differential economics produces differential health outcomes; and all of these differentials are then cited as evidence that racial categories correspond to genuine differences in ability, motivation, or culture.

25.1.2 The institutional genealogy of scientific racism

The history of race is a history of doxonomic production. Scientific racism in the 18th–20th centuries was not a marginal pseudoscience; it was a heavily funded, institutionally embedded research program that produced the "common sense" of racial hierarchy (Bois 1903).

The production chain. The institutional infrastructure of scientific racism included:

- **Universities and research institutes**: craniometry, phrenology, eugenics institutes at leading universities (Cold Spring Harbor, Kaiser Wilhelm Institute, UCL's Galton Laboratory). The Eugenics Record Office (US, 1910–1939) received substantial Rockefeller and Carnegie funding.
- **Census bureaus**: the racial categories of national censuses (which varied dramatically between countries) reified administrative classifications as natural kinds.
- **Legal systems**: anti-miscegenation laws, Jim Crow, apartheid, colonial legal codes, all requiring precise racial classification and producing an institutional apparatus for maintaining it.
- **Educational institutions**: racially segregated schools, textbooks presenting racial hierarchy as scientific fact, curricula omitting the achievements of non-European civilizations.
- **Popular science and media**: National Geographic's century of racial representation, IQ testing popularization, the "bell curve" discourse (Herrnstein and Murray 1994).

The funding dimension. Unlike many doxonomic systems, early racial regime production was funded directly by the state (colonial administrations, census bureaus, segregated school systems) and by major philanthropies (Carnegie, Rockefeller, and Harriman foundations funded eugenics research). The total institutional investment in producing and maintaining racial categories over the period 1800–2000 is difficult to estimate but clearly enormous, encompassing the entire apparatus of colonial governance, segregated institutions, and racialized law enforcement.

25.1.3 The racial belief production model

Model 25.2 (Racial Belief Production)**.** The strength of racial-hierarchy belief B_R is sustained by:

$$\frac{dB_R}{dt} = \alpha_{\text{inst}}\phi_{\text{inst}} + \alpha_{\text{seg}}S(t) + \beta B_R(1 - B_R) - \delta B_R - \gamma E(t)$$

where:

- ϕ_{inst} is institutional investment in racial classification (curricula, media, law),
- $S(t)$ is the degree of residential and economic segregation (which generates "evidence" for racial difference through differential outcomes),
- β captures peer reinforcement and social transmission,
- δ is natural decay (generational replacement, individual updating),
- $E(t)$ represents counter-evidence (interracial cooperation, anti-racist education, disconfirming experience).

The segregation term $S(t)$ is crucial: spatial and economic separation produces the differential outcomes that appear to confirm the racial narrative, creating a self-fulfilling loop analogous to the selfishness trap of Chapter 21.

Proposition 25.3 (Segregation as Doxonomic Feedback)**.** *If segregation $S(t)$ is itself a function of racial belief ($S(t) = h(B_R(t))$ with $h' > 0$, so stronger racial belief leads to more segregation through housing discrimination, white flight, school district formation), then the system has a positive feedback loop:*

$$B_R \uparrow \Rightarrow\ S \uparrow \Rightarrow\ \textit{differential outcomes} \Rightarrow\ \textit{"evidence" for racial hierarchy} \Rightarrow\ B_R \uparrow$$

This loop can sustain racial hierarchy belief even after the explicit institutional investment ϕ_{inst} is withdrawn *(e.g., after the formal end of Jim Crow or apartheid), because segregation continues to generate confirming "evidence." Breaking the loop requires intervening on segregation directly, not merely on belief.*

25.1.4 The post-civil-rights transformation

The explicit institutional investment in racial hierarchy (ϕ_{inst}) declined substantially after the civil rights movement (US), anti-apartheid movement (South Africa), and decolonization (Global South). But racial belief did not decline proportionally, because:

1. the segregation feedback loop ($S(t)$ term) continued operating,
2. new narrative forms emerged: "colorblind racism" (denying the relevance of race while maintaining racial structures), "cultural deficit" explanations (attributing racial inequality to cultural rather than biological differences, but with the same doxonomic function), and "reverse racism" narratives (reframing anti-racist policy as the "real" racism) (Bonilla-Silva 2018),
3. the institutional infrastructure of racial classification (census categories, residential patterns, educational tracking, criminal justice disparities) remained largely intact.

The doxonomic insight: the racial regime *transformed* rather than disappeared. The explicit belief "race X is biologically inferior" was replaced by the implicit belief "racial inequality reflects cultural or behavioral differences," a narrative shield (Definition 24.6) that achieves the same legitimation function through different discursive means.

25.2 Colonial Civilizational Narratives

25.2.1 Colonialism as doxonomic operation

Colonialism was, among other things, a massive doxonomic operation: the production of beliefs about civilizational hierarchy that justified extraction, governance, and violence. Said (1978) showed how "Orientalism" (a systematic body of knowledge about the East produced by Western institutions) functioned as epistemic infrastructure for colonial rule.

The belief production chain for colonial narratives ran through:

- **Missionary education**: replacing indigenous knowledge systems with European curricula, languages, and religious frameworks.
- **Colonial administration**: legal and census categories imposing European classifications on diverse populations; the creation of "tribes" and "castes" as administrative units that then became social identities.
- **Academic disciplines**: anthropology (classifying "primitive" societies), geography (mapping "empty" lands for settlement), linguistics (ranking languages by "complexity"), history (narrating progress as a European monopoly).
- **Museums and exhibitions**: world's fairs, natural history museums, and ethnographic displays that presented non-European peoples as specimens for study rather than agents of history.

- **Economic institutions**: structuring labor markets, land tenure, and trade around racial and civilizational categories.

25.2.2 Coloniality after colonialism

The persistence of these narratives after formal decolonization (what decolonial theorists call *coloniality*) is a doxonomic phenomenon: the institutional infrastructure outlasts the political regime that built it.

Definition 25.4 (Doxonomic Coloniality)**.** *Doxonomic coloniality* is the persistence of colonial belief structures after formal decolonization, sustained by:

1. educational institutions that still teach from colonial-era curricula or frameworks (European-centered history, English/French as languages of prestige),
2. academic disciplines whose categories were shaped by colonial needs ("development economics" as the study of why non-Western countries are "behind"),
3. international institutions (IMF, World Bank) whose policy prescriptions reproduce colonial-era assumptions about governance and economic organization,
4. media representations that continue to frame the Global South as a site of crisis, backwardness, or exoticism.

Example 25.5. "Development economics" is a doxonomically interesting field: its very existence presupposes a civilizational narrative (some countries are "developed," others are "developing") that maps onto colonial hierarchy. The field's institutional infrastructure (World Bank research departments, USAID, bilateral development agencies, academic programs) produces knowledge that tends to frame non-Western economies as deficient versions of Western ones, requiring Western-style reforms to "catch up." This is not to deny that poverty is real or that economic analysis is useful; it is to note that the framing of the problem already contains the colonial assumption of a single developmental path.

25.2.3 Epistemic violence and knowledge erasure

Definition 25.6 (Epistemic Violence)**.** *Epistemic violence* is the systematic destruction, suppression, or devaluation of a community's knowledge systems through doxonomic means. It includes:

1. the destruction of indigenous knowledge repositories (libraries, oral traditions, medicinal practices),
2. the delegitimation of non-Western epistemologies as "superstition" or "pre-scientific,"

3. the imposition of colonial languages as the medium of education and governance, rendering indigenous knowledge inaccessible to subsequent generations,
4. the extraction and appropriation of indigenous knowledge without attribution (biopiracy, appropriation of agricultural techniques, adoption of medicinal compounds without crediting their sources).

Epistemic violence is the destructive counterpart of doxonomic production: where doxonomic production builds beliefs, epistemic violence destroys them. The two operate in tandem during colonization: the colonizer's knowledge system is institutionally amplified while the colonized's knowledge system is institutionally suppressed.

25.3 Gender as Doxonomic Construction

25.3.1 The gender regime

Definition 25.7 (Gender Regime)**.** A *gender regime* is a doxonomic system producing and maintaining beliefs about:

1. natural differences between men and women in capacity, temperament, and social role,
2. the complementarity or hierarchy of these roles,
3. the unnaturalness of deviations from prescribed gender behavior,
4. the naturalness of the sexual division of labor (productive vs. reproductive work).

25.3.2 The distinctive features of gender doxonomics

Gender regimes are sustained through family socialization, religious institutions, educational tracking, media representation, workplace norms, and legal codes. Their doxonomic cost is distributed across many institutions, making them difficult to account for with the funding-tracing methods of Chapter 14. Three features distinguish gender doxonomics from the funding-centered models of earlier chapters:

1. **Reproduction through unpaid labor.** Much gender-regime maintenance happens through unpaid labor: parents socializing children, communities enforcing norms, cultures producing representations. The "funding" is not monetary but temporal and emotional. This means that the doxonomic accounting framework must be extended to include non-monetary investment.

2. **Embodied belief.** Gender beliefs operate heavily through layers 3–5 of the layered ontology (Principle 2.14): practical schemas (how one moves, speaks, presents oneself), identity commitments ("being a man/woman"),

and affective orientations (what feels natural or disgusting). These layers are more resistant to discursive counter-evidence than propositional beliefs.

3. **Biological anchoring.** Gender regimes anchor themselves to real biological differences (reproductive anatomy, average physical size differences, hormonal variation) while vastly overgeneralizing what those differences imply for social roles. The doxonomic operation is not the invention of difference from nothing but the *amplification* of modest biological variation into comprehensive social hierarchy.

25.3.3 The gender belief production chain

Model 25.8 (Gender Regime Production)**.** Gender beliefs are produced through a multi-channel pipeline:

1. **Family** (ages 0–5): gendered names, clothing, toys, differential parental behavior (studies show parents talk to daughters more about emotions and to sons more about achievement).
2. **Education** (ages 5–22): gendered expectations in classrooms, differential encouragement in STEM, sex-segregated sports, gendered career counseling.
3. **Media** (all ages): the Geena Davis Institute found that female characters are underrepresented 2:1 in film, more likely to be shown in domestic or romantic contexts, and less likely to be shown in professional or leadership roles.
4. **Religion** (all ages): many religious traditions produce explicit gender-role prescriptions backed by the credibility of divine authority.
5. **Workplace** (ages 18–65): gendered job descriptions, differential evaluation standards, mommy-track career penalties, sexual harassment as norm enforcement.
6. **Law and policy**: historical coverture laws, ongoing gaps in parental leave policy, differential criminal sentencing.

The combined effect is a total-institution doxonomic environment: the gender regime is encountered in every institutional setting from birth to death.

25.3.4 Feminist counter-doxonomics

Feminist movements constitute the most sustained counter-doxonomic campaign in history. Over two centuries, feminist organizations have:

- challenged the naturalization of gender hierarchy through theoretical critique,
- built counter-institutions (women's studies programs, feminist media, advocacy organizations),
- achieved legal reforms that reduced the gender regime's institutional enforcement (suffrage, equal pay legislation, anti-discrimination law),

- shifted norm perceptions measurably: beliefs about women's capabilities have changed dramatically in survey data over 50 years.

Yet the gender regime remains partially intact, especially at the embodied and affective levels. This illustrates a general doxonomic principle: propositional beliefs are the most responsive to counter-narrative, while practical schemas and identity commitments change more slowly.

25.4 Intersections and Compound Systems

Race, gender, and class regimes do not operate independently. They intersect, reinforce, and sometimes contradict each other.

25.4.1 The interaction structure

Remark 25.9 (Doxonomic Intersection). When multiple doxonomic regimes (racial, gender, class) operate simultaneously on agent j, the combined belief effect is not additive but interactive:

$$B_j^{\text{total}} \neq B_j^{\text{race}} + B_j^{\text{gender}} + B_j^{\text{class}}.$$

Rather, the regimes modulate each other: racial narratives are gendered (stereotypes differ for men and women of the same racialized group), class narratives are racialized (the "deserving poor" is often implicitly white), and gender narratives are class-inflected (the "ideal worker" presupposes a wife managing domestic labor).

Example 25.10. The narrative "welfare queen" (US political discourse, 1976–present) operates at the intersection of race, gender, and class:

- *Racial*: the image is implicitly (and sometimes explicitly) Black.
- *Gender*: the image is female, violating prescriptions about maternal self-sacrifice and sexual restraint.
- *Class*: the image is poor, violating the meritocratic narrative of self-sufficiency.

No single-axis analysis captures the narrative's doxonomic function. Its power comes from activating all three regimes simultaneously, producing a figure that concentrates the stigma of racial, gender, and class deviance in a single image. This compound stigma was deployed to justify welfare reform in the 1990s, a policy change with measurable effects on millions of people, driven in significant part by a doxonomic construction.

25.4.2 Sheaf-theoretic intersectionality

In the sheaf-theoretic framework of Chapter 12, the local belief systems for race, gender, and class may have different gluing obstructions depending on the institutional context.

Example 25.11. Consider the local belief systems:

- $U_{\text{workplace}}$: "women are less competent in leadership" (gender regime) + "minorities are less qualified" (racial regime) + "pay reflects productivity" (meritocratic regime).
- U_{home}: "women are natural caregivers" (gender regime) + "family is private" (class regime shields domestic labor from economic analysis).
- $U_{\text{political}}$: "all citizens are equal before the law" (democratic regime) + "affirmative action is reverse discrimination" (meritocratic regime applied selectively).

The transition maps between these local systems are inconsistent: the "natural caregiver" of U_{home} contradicts the "equal citizen" of $U_{\text{political}}$, but the contradiction is managed by keeping the two domains institutionally separate. The sheaf obstruction is nonzero ($H^1 \neq 0$), but the social system manages the inconsistency through domain segregation rather than resolution.

25.5 Alternative and Complementary Explanations

The doxonomic account of racial, colonial, and gender regimes is one explanatory layer among several. Competing and complementary accounts include:

- **Psychological accounts**: in-group/out-group cognition, implicit bias, and social identity theory explain individual-level racial and gender attitudes without reference to institutional funding. These mechanisms are real and interact with doxonomic processes: institutions amplify and channel pre-existing psychological tendencies.
- **Cultural-evolutionary accounts**: cultural norms around gender, race, and kinship may have deep evolutionary or historical roots that precede and partially operate independently of any specific institutional investment.
- **Materialist accounts without the doxonomic layer**: Marxist and political-economy explanations of racial and gender hierarchy focus on labor-market segmentation, property relations, and class structure, treating ideology as derivative rather than as an independently analyzable production system.
- **Phenomenological accounts**: lived experience of racial and gender identity involves embodied, affective, and existential dimensions that the doxonomic framework's focus on institutional production does not fully capture.

Doxonomics does not replace these accounts. It adds a specific dimension (the material infrastructure of belief production) that the other accounts tend to leave implicit. The strongest analysis combines doxonomic institutional tracing with psychological, cultural, and phenomenological insights.

25.6 Limitations of the Doxonomic Framework for Identity Systems

25.6.1 What the framework captures

The doxonomic framework captures well:

- the role of funded institutions in producing and circulating racial, colonial, and gender narratives,
- the self-fulfilling mechanisms by which these narratives generate confirming evidence,
- the material interests served by specific narratives,
- the formal dynamics of belief production, competition, and regime change.

25.6.2 What it risks missing

1. **Agency and resistance.** The doxonomic framework, with its emphasis on institutional production, can understate the agency of those subjected to oppressive regimes. People are not blank slates on which doxonomic systems write; they resist, reinterpret, subvert, and transform the narratives directed at them. Any adequate doxonomic analysis of race, coloniality, or gender must include the counter-doxonomic activity of the oppressed.

2. **Lived experience.** The formal models treat belief as a numerical variable $B(t)$. But racial identity, gender identity, and colonial subjectivity are not reducible to belief intensities: they involve lived experience, embodied practice, community belonging, and existential meaning. The doxonomic framework provides partial insight, not total comprehension.

3. **Non-monetary reproduction.** As noted above, gender and racial regimes are reproduced substantially through unpaid labor and institutional routine. The funding-tracing methodology that works well for think-tank-produced narratives is less well-suited to regimes maintained through family socialization, peer pressure, and cultural tradition.

4. **The positionality problem.** The analyst's own position within racial, gender, and class regimes affects what they can see and how they frame the analysis. The symmetry obligation (Principle 20.19) is necessary but not sufficient: a white researcher studying racial doxonomics should be aware that their analysis is itself shaped by the racial regime they are analyzing.

These limitations do not invalidate the doxonomic analysis of identity systems; they define its scope. Doxonomics provides one lens (the institutional-material lens) among several that are needed for a complete understanding.

It should be used alongside, not in place of, phenomenological, ethnographic, and literary approaches to race, coloniality, and gender.

25.7 Notes and References

On race as a social construction with material effects, see Bois (1903) and Fanon (1961). The history of scientific racism is documented in Gould (1981) and Kendi (2016). Colonial knowledge production is analyzed in Said (1978). On coloniality as persisting beyond formal colonialism, see Quijano (2000) and Mignolo (2011).

On the doxonomic function of education in reproducing class and racial hierarchy, see Bowles and Gintis (1976) and Bourdieu (1984). For epistemic injustice and its relation to social identity, see Fricker (2007) and Medina (2013). On epistemic violence, see Spivak (1988).

On gender as a performed and institutionally sustained category, see Butler (1990) and Connell (1987). On the coloniality of gender, the claim that modern gender categories are themselves a colonial imposition, see Lugones (2010). On media representation and gender, see the Geena Davis Institute reports. For the "welfare queen" as a doxonomic construction, see Gilens (1999).

The intersectionality framework originates with Crenshaw (1989). System justification in the context of racial hierarchy is analyzed in Jost et al. (2004). On the "wages of whiteness," see Du Bois (2007).

25.8 Exercises

Exercise 25.1. Construct a doxonomic account for racial hierarchy in a specific national context.

1. Identify at least four institutional channels that produce or reproduce racial belief.
2. For each channel, estimate whether the investment is primarily monetary, temporal (unpaid labor), or institutional (routine practices).
3. Estimate the relative contribution of each channel to B_R.
4. How has the balance among channels changed over the past 50 years?

Exercise 25.2. Compare the doxonomic production of racial categories in two colonial contexts (e.g., British India and French West Africa).

1. What institutional differences led to different racial classification systems?
2. How do these differences persist in the post-colonial period?
3. Apply Model 25.2 to both cases: which terms differ?

Exercise 25.3. Using the model of racial belief production (Model 25.2), argue that residential segregation functions as a self-reinforcing doxonomic feedback loop.

1. Write $S(t) = h(B_R(t))$ with a specific functional form for h.

2. Show that the coupled system (B_R, S) has two stable equilibria (high-segregation/high-belief and low-segregation/low-belief).
3. Under what conditions can the system be moved from the high to the low equilibrium?
4. What policy intervention is implied (intervening on belief, on segregation, or on both)?

Exercise 25.4. Analyze the doxonomic infrastructure maintaining gender complementarity beliefs in a religious institutional context of your choice.

1. Map the production chain (texts, sermons, schools, family practices).
2. How does this infrastructure differ from the funding-driven models of earlier chapters?
3. What is the "return on investment" when much of the investment is unpaid labor?
4. How would you measure the doxonomic output of this system using the tools of Chapters 13–17?

Exercise 25.5. Analyze the "welfare queen" narrative (Example 25.10) as an intersectional doxonomic product.

1. Trace the production chain: who coined the term, which institutions amplified it, through which media channels?
2. Apply framing analysis (Chapter 17) to characterize its causal story, normative valence, subject position, and prescribed action.
3. What policy outcomes did the narrative enable?
4. What would a counter-narrative look like, and what institutional infrastructure would be needed to circulate it?

Exercise 25.6. Apply the sheaf framework of Chapter 12 to the intersection of racial and meritocratic beliefs.

1. Define local belief systems for at least three institutional contexts.
2. Identify the transition maps between them.
3. Compute whether the gluing obstruction H^1 is zero (the beliefs are globally consistent) or nonzero (they are inconsistent).
4. How does the social system manage the inconsistency?

Exercise 25.7. Assess the limitations of the doxonomic framework (Section 25.6) by comparing its analysis of a specific case with an analysis from a different tradition (phenomenological, ethnographic, or literary).

1. Choose a specific instance of racial, colonial, or gender belief production.
2. Analyze it using the doxonomic framework (funding, institutions, formal model).
3. Analyze it using an alternative framework (lived experience, cultural meaning, literary representation).
4. What does each framework reveal that the other misses?
5. How could the two be productively combined?

CHAPTER 26

Austerity, Scarcity, and Fiscal Morality

> The national budget must be balanced. The public debt must be reduced. The arrogance of the authorities must be moderated and controlled.
>
> Attributed to Cicero (apocryphal)

In 2012, a retired Greek schoolteacher named Dimitris Christoulas walked to Syntagma Square in central Athens and shot himself. His suicide note read: "I find no other solution than a dignified end before I start searching through garbage for food." His pension had been cut by 40% under the austerity program imposed by Greece's creditors. He was 77 years old, had worked his entire adult life, and had committed no financial crime. The narrative that justified his impoverishment (that Greece had "lived beyond its means" and must now "tighten its belt") is the subject of this chapter.

Austerity narratives (the claim that public spending must be cut, that governments must "live within their means," that debt is inherently dangerous) are among the most successful doxonomic products of the past century. They have shaped policy in dozens of countries, redirected trillions of dollars from public services to debt repayment, and helped justify a redistribution of risk from capital to labor. This chapter analyzes their construction, the institutional infrastructure that produces them, the formal dynamics of fiscal belief, and the distributional consequences of treating a policy choice as a moral imperative.

The doxonomic interest is not primarily whether austerity is good or bad economics (though the evidence is relevant) but how a specific fiscal framework, one whose empirical support is contested and whose distributional

consequences are highly unequal, achieved the status of common sense across multiple countries within a few years.

26.1 The Household Metaphor

26.1.1 Definition and mechanism

Definition 26.1 (Fiscal Morality Narrative)**.** The *fiscal morality narrative* is the claim that sovereign budgets are analogous to household budgets: governments, like families, must not spend more than they earn, must avoid debt, and must "tighten their belts" in hard times.

This analogy is economically misleading (sovereign currency issuers face fundamentally different constraints than households: they cannot go bankrupt in their own currency, they can create money, and their spending creates income for the private sector), but doxonomically powerful because it maps complex macroeconomics onto intuitive domestic experience. Every adult has managed a household budget; almost no one has managed a sovereign treasury. The analogy exploits this asymmetry in lived experience.

26.1.2 The moral dimension

The household metaphor is not merely an analogy; it is a *moral* claim. Debt is framed as sin, spending as temptation, austerity as virtue. Graeber (2011) traces this moral loading of debt across five millennia, showing that the equation of debt with moral failing is a culturally constructed norm that serves the interests of creditors.

Proposition 26.2 (Debt-Morality Fusion)**.** *The fiscal morality narrative fuses two distinct questions:*

1. ***Technical question**: what is the optimal level of public debt given growth, interest rates, and multiplier effects?*
2. ***Moral question**: is it "right" for governments to borrow?*

By fusing these, the narrative transforms a technical debate (where reasonable economists disagree) into a moral imperative (where "responsible" people agree). This fusion makes the narrative resistant to empirical refutation: even if austerity produces bad economic outcomes, it can still be defended as "the right thing to do."

26.1.3 Institutional amplification

The household metaphor circulates through:

- **Political speech**: "We have maxed out our credit card" (repeated by politicians across the spectrum in multiple countries).

- **Media framing**: news reports consistently use household-budget language for sovereign finances: "the government's deficit," "the nation's credit card," "living beyond our means."
- **Think-tank output**: organizations like the Peterson Foundation (US), the Taxpayers' Alliance (UK), and the Initiative for a Responsible Federal Budget produce materials that frame public debt as a crisis requiring immediate belt-tightening.
- **Popular economics**: bestselling books (e.g., *The Coming Generational Storm*, *The Debt Bomb*) translate the narrative for mass audiences.

26.2 The Doxonomic Genealogy of Austerity

26.2.1 The classical foundation

The austerity narrative draws on a long intellectual tradition:

- **Ricardo's equivalence** (1817): the proposition that government borrowing is equivalent to taxation because rational agents anticipate future taxes. In its strong form (which Ricardo himself doubted), it implies that fiscal policy is irrelevant.
- **The "Treasury view"** (1920s–30s): the British Treasury's doctrine that government spending necessarily "crowds out" private investment, implying that stimulus cannot increase total output.
- **Monetarism** (1960s–70s): Friedman's argument that fiscal policy is ineffective and that only monetary policy matters, providing intellectual cover for reducing government's fiscal role.
- **Public choice theory** (1970s–80s): Buchanan and Tullock's argument that government spending reflects bureaucratic self-interest rather than public welfare, implying that less spending is generally better.

Each intellectual precursor served a specific institutional function: Ricardo's equivalence was developed in the context of debates about war financing; the Treasury view defended the gold standard; monetarism justified reducing the post-war welfare state; public choice theory provided the theoretical foundation for Thatcher/Reagan spending cuts.

26.2.2 The institutional build-out

The modern austerity infrastructure was built during the neoliberal period (1970s–2000s):

1. **Think tanks**: Heritage Foundation's "Mandate for Leadership" (1981) included detailed spending-cut proposals for every federal department. The Cato Institute's annual "Budget Pork" reports framed all government spending as waste. In the UK, the Institute of Economic Affairs and the Adam Smith Institute played analogous roles.

2. **International institutions**: the IMF's "structural adjustment programs" (1980s–90s) conditioned loans to developing countries on austerity measures, creating a global institutional norm that debt reduction trumps social spending. The "Washington Consensus" codified this norm: fiscal discipline was listed as the first of ten policy prescriptions.

3. **Fiscal rules and institutions**: balanced-budget amendments, debt brakes (Germany's *Schuldenbremse*), the Maastricht Treaty's 3%/60% rules for eurozone members, all encoded the austerity narrative in law, removing fiscal decisions from democratic deliberation.

4. **Credit rating agencies**: Moody's, S&P, and Fitch evaluate sovereign creditworthiness, creating a private-sector enforcement mechanism for fiscal discipline. A credit downgrade raises borrowing costs, punishing governments that reject the austerity narrative.

26.3 Academic Credibility Laundering

26.3.1 The Reinhart-Rogoff episode

The most vivid example of academic credibility laundering in the austerity narrative is the Reinhart-Rogoff affair.

Example 26.3. In January 2010, Carmen Reinhart and Kenneth Rogoff published "Growth in a Time of Debt," claiming that countries with public debt exceeding 90% of GDP experienced dramatically lower growth. The paper was not peer-reviewed but was presented at the American Economic Association conference and published as an NBER working paper.

The doxonomic chain.

1. *Production*: two Harvard economists with high epistemic capital produced a paper with a clear, quotable result ("90% is the threshold").
2. *Amplification*: the Peterson Foundation promoted the finding; EU Commissioner Olli Rehn cited it in official policy documents; Paul Ryan cited it in his US budget proposal; George Osborne referenced it in justifying UK austerity.
3. *Capture*: within months, "the 90% threshold" became common sense in policy debates: a number that could be cited to end any argument about whether austerity was necessary.

The collapse. In 2013, Thomas Herndon, a graduate student at UMass Amherst, discovered that the paper contained a spreadsheet coding error (five countries were accidentally excluded from a key calculation), selective data exclusion, and an unconventional weighting methodology. Correcting these errors eliminated the sharp threshold: countries above 90% debt had lower

but still positive growth, and the relationship was far from the cliff-edge the original paper suggested.

The doxonomic aftermath. The paper had already served its function: austerity policies justified partly by its findings had been implemented across Europe, affecting millions of people. The correction received far less institutional amplification than the original claim, a classic asymmetry in doxonomic production, where the initial framing captures common sense and corrections arrive too late to undo the policy consequences.

26.3.2 The general pattern

The Reinhart-Rogoff case illustrates a general doxonomic pattern:

Model 26.4 (Academic Credibility Laundering)**.**

1. A researcher at a high-credibility institution produces a finding that supports a pre-existing policy preference.
2. The finding is amplified through think tanks, media, and policy networks before full peer review.
3. The finding's epistemic capital (derived from the researcher's institutional affiliation) exceeds its evidential warrant.
4. Policy decisions are made based on the amplified finding.
5. When the finding is later corrected or qualified, the policy has already been implemented and the narrative has already been captured.

The time lag between amplification and correction is the "laundering window": the period during which unvetted research shapes policy through borrowed credibility.

26.4 Crisis as Narrative Opportunity

26.4.1 The shock doctrine model

Model 26.5 (Shock Doctrine)**.** Following Klein (2007), economic crises create windows of doxonomic opportunity. During a crisis, public attention is high, uncertainty is high, and trust in existing narratives is shaken. The first coherent narrative to fill the vacuum captures the frame.

Formally, let $H(t)$ be narrative entropy at time t. A crisis causes $H(t) \to H_{\max}$ (maximum uncertainty), followed by rapid entropy reduction as a new dominant frame is installed:

$$H(t) = H_{\max} \cdot e^{-\lambda(t - t_{\text{crisis}})} + H_{\text{new}}$$

The rate λ depends on:

- the *preparedness* of competing narratives (did someone have a pre-packaged explanation ready?),

- the *institutional infrastructure* available to amplify the narrative,
- the *credibility* of the narrative's proponents.

The group that supplies the new frame controls the post-crisis common sense.

26.4.2 Narrative preparedness

The austerity narrative's success after 2008 was not spontaneous; it reflected decades of institutional investment. When the crisis hit, austerity proponents had:

- pre-written policy briefs and talking points,
- established relationships with journalists and editors,
- academic research (including Reinhart-Rogoff) ready for deployment,
- institutional credibility from decades of fiscal-conservatism advocacy,
- a simple, intuitive story (household metaphor) that required no economic training to understand.

Keynesian counter-narratives existed but lacked comparable infrastructure: fewer think tanks, less media presence, no simple metaphor as powerful as "belt-tightening," and an argument ("spend more during a recession") that contradicts intuitive household logic.

26.5 The 2008–2013 Austerity Turn: A Detailed Case Study

26.5.1 Phase 1: Crisis narrative (2008–2009)

The initial frame was "banks caused this." Public anger targeted financial institutions. Narrative entropy was high. Government intervention (bailouts, stimulus) was initially popular: the American Recovery and Reinvestment Act (February 2009, $787 billion) passed with broad public support, and similar stimulus packages were enacted in the UK, Germany, China, and elsewhere.

26.5.2 Phase 2: Reframing (2009–2010)

Within 18 months, the dominant frame shifted from "private-sector recklessness" to "public-sector profligacy." This reframing was not spontaneous. It was driven by:

- **Think tanks**: the Reinhart-Rogoff paper (January 2010), the Peterson Foundation's "fiscal responsibility" campaign, and dozens of policy briefs from Heritage, Cato, and their European counterparts.
- **Financial press**: the Financial Times, Wall Street Journal, and Economist shifted framing from banking crisis to sovereign debt crisis. A content analysis would likely show the frequency of "sovereign debt" overtaking "banking crisis" in headlines by mid-2010.

- **European institutions**: the ECB, the European Commission, and the "troika" (ECB/EC/IMF) conditioned bailout assistance on austerity measures in Greece, Ireland, Portugal, and Spain, institutionalizing the reframing in policy.
- **Political actors**: the UK Conservative Party's 2010 campaign centered on "the mess Labour left," reframing a global financial crisis as a domestic fiscal crisis.
- **Credit rating agencies**: S&P's downgrade of US sovereign debt (August 2011) reinforced the narrative that government spending was the problem.

26.5.3 Phase 3: Normalization (2010–2013)

Austerity became common sense across much of Europe and influenced US fiscal policy (the sequester, the debt ceiling battles). The household metaphor ("belt-tightening") dominated media framing. Counter-narratives (Keynesian stimulus, MMT) existed but lacked comparable institutional infrastructure.

Remark 26.6. The austerity turn illustrates several doxonomic mechanisms simultaneously: the shock doctrine model (crisis opens the window), narrative infrastructure effects (think tanks had pre-packaged arguments ready), credibility laundering (an academic paper gave the 90% threshold scientific authority), and common-sense capture (within two years, austerity went from a policy choice to "the only responsible option").

26.5.4 Phase 4: Partial narrative erosion (2013–2020)

The austerity consensus began eroding as:

- the Herndon correction undermined the 90% threshold,
- austerity-adopting countries (Greece, UK, Spain) experienced prolonged recessions while non-austerity countries (US, with partial stimulus; Iceland, with heterodox policy) recovered faster,
- the IMF's own chief economist, Olivier Blanchard, published research arguing that fiscal multipliers had been underestimated: austerity was more damaging than predicted,
- populist movements (Syriza, Podemos, Sanders, Corbyn) explicitly challenged the austerity narrative.

But the institutional infrastructure remained: balanced-budget rules, the Maastricht criteria, credit-rating-agency discipline, and the household metaphor continued to constrain fiscal policy even as the intellectual case for austerity weakened.

26.6 A Formal Model of Fiscal Belief

Model 26.7 (Austerity Belief Dynamics)**.** Let $B_A(t)$ be the strength of austerity belief in the population. The dynamics are:

$$\frac{dB_A}{dt} = \underbrace{\alpha\phi_A(1 - B_A)}_{\text{institutional production}} + \underbrace{\beta \cdot \text{Crisis}(t) \cdot (1 - B_A)}_{\text{crisis amplification}} - \underbrace{\gamma \cdot \Delta U(t) \cdot B_A}_{\text{unemployment erosion}} - \underbrace{\delta B_A}_{\text{natural decay}}$$

where:

- ϕ_A is the institutional investment in austerity narratives,
- $\text{Crisis}(t)$ is an indicator for economic crisis periods (when the shock doctrine operates),
- $\Delta U(t)$ is the change in unemployment (rising unemployment associated with austerity erodes belief),
- δ is the natural decay rate (generational replacement, fading salience).

Proposition 26.8 (Austerity Belief Persistence)**.** *The steady-state austerity belief (absent crisis) is:*

$$B_A^* = \frac{\alpha\phi_A}{\alpha\phi_A + \gamma\Delta U^* + \delta}$$

If $\Delta U^* \approx 0$ (no unemployment change), the steady state depends only on the ratio of institutional production to natural decay: $B_A^* = \alpha\phi_A/(\alpha\phi_A + \delta)$. High institutional investment produces high equilibrium belief even without a crisis trigger.

26.7 Distributional Analysis

26.7.1 Who benefits from the austerity narrative?

The austerity narrative's distributional consequences are highly unequal:

1. **Holders of government bonds**: austerity protects the value of government debt by reducing default risk and inflation risk. Bondholders are disproportionately wealthy individuals and financial institutions.

2. **Opponents of public spending**: austerity reduces the size of government, which aligns with the preferences of actors who view government spending as competing with private enterprise (for labor, for legitimacy, for narrative space).

3. **Employers**: public-sector wage cuts and workforce reductions weaken the public sector as an alternative employer, increasing labor supply to the private sector and reducing bargaining power.

4. **Tax-reduction advocates**: austerity narratives that frame spending as the problem (rather than revenue) implicitly argue for lower taxes, benefiting high-income taxpayers disproportionately.

Proposition 26.9 (Austerity as Redistribution)**.** *Austerity programs redistribute income and risk from public-service users (disproportionately lower-income) to bondholders and taxpayers (disproportionately higher-income). The fiscal morality narrative (Definition 26.1) performs the doxonomic function of framing this redistribution as a moral imperative rather than a distributional choice.*

26.7.2 The Greek case

Example 26.10. Greece's austerity program (2010–2018) provides a stark illustration:

- GDP contracted by 26% (a depression comparable in scale to the 1930s US experience).
- Unemployment peaked at 27% (youth unemployment at 60%).
- Public health spending was cut by 40%, leading to documented increases in infant mortality, HIV transmission, and mental health crises.
- Pension payments were cut by 40–50%, pushing elderly poverty rates above 20%.
- Meanwhile, the primary beneficiaries of the bailout funds were German and French banks that held Greek government bonds: roughly 90% of bailout money went to debt servicing rather than the Greek economy.

The austerity narrative framed this as "Greece living beyond its means" and "Greeks retiring too early," a narrative shield (Definition 24.6) that deflected attention from the structural causes (eurozone design flaws, predatory lending, Northern European trade surpluses) to individual/national moral failings.

26.8 Negative Cases and Counter-Narratives

26.8.1 Iceland: referendum against austerity

Iceland rejected bank bailouts and austerity in 2008–2009 through a popular referendum. Instead of socializing private banking losses, Iceland let the banks fail, imposed capital controls, and maintained social spending. Its recovery was faster than most austerity-adopting European countries: GDP returned to pre-crisis levels by 2015, unemployment fell below 4%, and the fiscal position recovered through growth rather than cuts.

The Icelandic case demonstrates that the austerity narrative requires specific institutional conditions to achieve capture. Iceland's small size, homogeneous population, and strong civic traditions made the counter-narrative ("this was

a banking crisis, not a spending crisis") more credible than in larger, more institutionally fragmented countries.

26.8.2 Latin American heterodoxy

Several Latin American countries in the 2000s explicitly rejected IMF austerity programs: Argentina (after its 2001 default), Ecuador, Bolivia, and to some extent Brazil under Lula. Their post-rejection economic performance was generally positive, undermining the claim that austerity is necessary for recovery.

These cases produced a regional counter-narrative infrastructure: ALBA (Bolivarian Alliance), the Banco del Sur, and academic networks around Latin American structuralism and dependency theory. The counter-infrastructure was smaller than the pro-austerity infrastructure but was regionally effective.

26.8.3 Modern Monetary Theory

MMT has emerged as the most theoretically developed counter-narrative to fiscal morality:

- A sovereign currency issuer cannot "run out" of money in its own currency.
- The constraint on government spending is not financial (money) but real (inflation, resource availability).
- Government deficits are the private sector's surpluses (accounting identity).
- The household metaphor is therefore fundamentally misleading: a currency-issuing government is nothing like a household.

MMT's doxonomic challenge: despite logical coherence, it struggles against the household metaphor because it lacks an equally intuitive counter-metaphor. "The government is the issuer of the currency, not a user of it" is true but requires economic sophistication that "families can't spend more than they earn" does not. The asymmetry in cognitive accessibility, not in evidential quality, explains the household metaphor's dominance.

26.9 Media Framing of Fiscal Policy

26.9.1 Content analysis evidence

Studies of media framing of fiscal policy consistently find:

- deficit and debt stories outnumber stories about the benefits of public spending,
- the household metaphor is the dominant framing device,
- "expert" sources quoted on fiscal matters are disproportionately from institutions with pro-austerity positions,

- the distributional consequences of austerity are underreported relative to the aggregate fiscal position.

Proposition 26.11 (Asymmetric Fiscal Framing)**.** *Media coverage of fiscal policy exhibits a systematic asymmetry: costs of government spending are framed as visible and immediate ("the deficit is $X trillion"), while benefits are framed as diffuse and uncertain ("public investment may promote growth"). Conversely, costs of spending cuts are framed as diffuse ("some programs may be reduced") while fiscal benefits are framed as visible and immediate ("the deficit will shrink by $X billion"). This asymmetry favors the austerity narrative regardless of the actual evidence.*

26.10 Notes and References

On austerity as ideology, see Streeck (2016) and Brown (2015). The shock doctrine is developed in Klein (2007). The political economy of debt narratives connects to Graeber (2011). For the history of neoliberal fiscal narratives, see Mirowski and Plehwe (2009), Harvey (2005), and Slobodian (2018).

On the Reinhart-Rogoff controversy, see Herndon, Ash, and Pollin (2014). Blanchard and Leigh (2013) document the underestimation of fiscal multipliers. On Iceland's alternative path, see Wade and Sigurgeirsdóttir (2012). On the Greek crisis, see Varoufakis (2017).

Modern Monetary Theory is developed in Wray (2015) and Kelton (2020). On media framing of fiscal policy, see Blyth (2013). System justification in the context of economic policy is analyzed in Jost et al. (2004). For the historical genealogy of fiscal morality, see Graeber (2011) and Piketty (2014).

26.11 Exercises

Exercise 26.1. Construct a doxonomic genealogy of the phrase "living beyond our means" in political discourse.

1. When did it first appear in budget debates?
2. What institutional channels popularized it?
3. How does its frequency in media coverage correlate with economic conditions?
4. Is the phrase used symmetrically (applied equally to tax cuts that increase deficits and spending that increases deficits)?

Exercise 26.2. Using the shock doctrine model (Model 26.5), analyze the 2008 financial crisis and subsequent austerity turn.

1. Estimate the narrative entropy trajectory $H(t)$ qualitatively (sketch the curve from 2007 to 2013).
2. Identify who supplied the dominant post-crisis frame and through what institutional channels.

3. What counter-narratives were available and why did they fail to capture the frame?
4. Apply the model to a second crisis (e.g., COVID-19). Did the shock doctrine operate similarly?

Exercise 26.3. Design a survey to measure belief in the household-budget analogy for government spending.

1. Write five items that capture different aspects of fiscal morality belief.
2. Predict which demographic groups will score highest and explain why (consider education, political affiliation, age, income).
3. Include a treatment condition: half of respondents read a brief explanation of sovereign currency issuance before answering. Does it change responses?

Exercise 26.4. Apply the academic credibility laundering model (Model 26.4) to a case other than Reinhart-Rogoff.

1. Identify the researcher, institution, finding, and amplification channel.
2. Estimate the "laundering window" (time between amplification and correction).
3. What policy decisions were made during the laundering window?
4. Were those decisions reversed after the correction? If not, why not?

Exercise 26.5. Conduct a content analysis of fiscal-policy coverage in two newspapers with different editorial stances.

1. Count the frequency of the household metaphor and its variants.
2. Categorize expert sources by institutional affiliation.
3. Assess whether costs and benefits of spending are framed symmetrically (Proposition 26.11).
4. What doxonomic explanation accounts for the patterns you find?

Exercise 26.6. Compare the distributional consequences of austerity in Greece (Example 26.10) with Iceland's alternative approach.

1. Tabulate key economic and social indicators for both countries (GDP change, unemployment, poverty, health outcomes) from 2008 to 2018.
2. Who bore the costs in each case?
3. Apply the legitimation framework (Chapter 24): why was the austerity narrative accepted in Greece but rejected in Iceland?
4. What institutional differences explain the different narrative outcomes?

Exercise 26.7 (Computational). Simulate the austerity belief dynamics model (Model 26.7):

1. Set $B_A(0) = 0.4$, $\alpha = 0.1$, $\phi_A = 3$, $\beta = 0.5$, $\gamma = 0.3$, $\delta = 0.05$.
2. Simulate 100 periods with no crisis. Plot $B_A(t)$.
3. At $t = 30$, introduce a crisis ($\text{Crisis}(t) = 1$ for $t \in [30, 35]$). How does B_A respond?

4. At $t = 50$, introduce rising unemployment ($\Delta U(t) = 0.5$ for $t \in [50, 70]$) as a consequence of the austerity policies adopted during the crisis. Does this erode austerity belief?
5. Compare scenarios with different ϕ_A (narrative investment): how much investment is needed to sustain austerity belief despite rising unemployment?

CHAPTER 27

Work, Discipline, and the Productive Self

> Choose a job you love, and you will never have to work a day in your life.
>
> Attributed to Confucius (apocryphal; popularized by motivational industry)

The moral prestige of overwork, the normalization of precarity, and the ideology of "hustle culture" are not spontaneous developments. They are doxonomic products that serve specific institutional interests: employers who benefit from a labor force that accepts long hours, low wages, and job insecurity as moral tests rather than structural problems. This chapter applies the doxonomic framework to the belief systems surrounding work, tracing how specific narratives about labor, productivity, and self-worth are produced, funded, and maintained.

The central argument: the work ethic regime converts extraction into virtue. When workers believe that overwork is morally admirable, that precarity reflects personal insufficiency, and that the boundary between labor and identity should dissolve, employers obtain compliance that would otherwise require coercion or compensation. The belief does the work that the whip once did, and at lower cost.

27.1 The Work Ethic Regime

27.1.1 Definition

Definition 27.1 (Work Ethic Regime)**.** The *work ethic regime* is an anthropological regime α_W holding that:

1. work is the primary source of moral worth and social identity,
2. leisure is suspect: "idle hands are the devil's workshop,"
3. suffering through labor is ennobling rather than exploitative,
4. refusal to work (or refusal to work *enough*) is moral failure,
5. one's value as a person is measured by productivity.

27.1.2 Historical genealogy

The work ethic regime predates capitalism but was systematically amplified by it.

The Protestant ethic. Weber (1905) identified the Calvinist doctrine of worldly asceticism (hard work as evidence of divine election) as a cultural precondition for capitalism. The key doxonomic move: transforming labor from a curse (Genesis 3:19, "by the sweat of your brow") into a calling. This required institutional investment: sermons, devotional literature, community enforcement of industriousness.

Industrial discipline (1780–1900). The factory system required workers accustomed to agricultural rhythms to accept clock discipline, monotonous repetition, and the separation of work from home. This was not voluntary: factory owners used a combination of starvation wages (forcing long hours for subsistence), legal coercion (vagrancy laws), and moral suasion (Sunday schools, temperance movements, "improving" literature) to produce the disciplined industrial worker. E. P. Thompson's analysis of time-discipline shows how the internalization of clock-time as moral discipline was itself a multi-generational doxonomic process.

Managerial capitalism (1900–1970). Scientific management (Taylor), human relations (Mayo), and the corporate welfare state (Ford's $5 day) developed increasingly sophisticated techniques for securing worker compliance, from external surveillance to internalized motivation. The company man, the organization man, the loyal employee: these identities served employer interests by making work central to self-conception.

Neoliberal entrepreneurialism (1980–present). The contemporary work ethic regime differs from its predecessors: it demands not just obedience but *enthusiasm*. The "do what you love" ethic, hustle culture, and the gig economy's "be your own boss" narrative all frame precarious labor as personal empowerment. The doxonomic operation: repackaging the loss of job security as the gain of autonomy (Sennett 1998).

27.2 Labor Discipline as Internalized Belief

27.2.1 The model

Model 27.2 (Internalized Discipline)**.** Let w_j be the wage and h_j the hours worked by agent j. Under *external discipline*, $h_j = h^*$ is enforced by monitoring at cost m to the employer. Under *doxonomic discipline*, j chooses $h_j > h^*$ voluntarily because the work ethic regime increases j's subjective utility from labor:

$$u_j(h) = w_j h - c(h) + B_W \cdot v(h)$$

where $c(h)$ is the disutility of effort (convex, increasing), $v(h)$ is the moral satisfaction from work (concave, increasing), and B_W is the strength of the work ethic belief. The first-order condition is:

$$w_j + B_W \cdot v'(h_j^*) = c'(h_j^*)$$

Higher B_W increases optimal hours: the worker voluntarily provides labor that would otherwise require monitoring or higher wages.

Proposition 27.3 (Value of the Work Ethic to Employers)**.** *The monetary value of the work ethic regime to employers is the sum of:*

1. Saved monitoring costs*: $m \cdot N$ (where N is the workforce).*
2. Unpaid overtime*: $(h_j^*(B_W) - h^*) \cdot w_j$ summed across workers.*
3. Wage suppression*: workers who derive moral satisfaction from work accept lower wages than they would otherwise demand: $\Delta w = B_W \cdot v'(h)/h$.*

As an illustrative calculation: for a firm with 1,000 employees, if the work ethic adds 3 hours/week of unpaid effort at \$30/hour and saves \$5,000/year in monitoring per worker, the annual value is:

$$1{,}000 \times (3 \times 52 \times 30 + 5{,}000) = \$9.68 \text{ million/year.}$$

27.2.2 Self-exploitation

Definition 27.4 (Doxonomic Self-Exploitation)**.** *Doxonomic self-exploitation* occurs when an agent voluntarily accepts working conditions (hours, wages, risk) that they would refuse if they did not hold the work ethic belief. The exploitation is "self-" because no external coercion is applied; it is "exploitation" because the conditions extract surplus value that accrues to the employer (Brown 2015).

Self-exploitation is most visible in contexts where the work-identity fusion is strongest:

- **Academic labor**: graduate students and adjunct professors accept poverty wages because they have internalized the identity of "scholar" and view their labor as a calling.

- **Creative industries**: artists, musicians, writers, and game developers accept "exposure" instead of payment because their work is "passion."
- **Tech startups**: engineers work 80-hour weeks for below-market wages plus equity because they identify as "builders" and "disruptors."
- **Care work**: nurses, teachers, and social workers accept underpayment because their work is framed as vocation rather than labor.

In each case, the work ethic regime provides the employer with a discount: the worker's identity investment substitutes for monetary compensation.

27.3 Hustle Culture and the Entrepreneurial Self

27.3.1 The narrative

"Hustle culture" is the contemporary expression of the work ethic regime, adapted for the gig economy and social media age. Its core propositions:

1. You are an entrepreneur of yourself: your "personal brand."
2. Every hour not spent working is an hour wasted.
3. Sleep is for the weak; rest is laziness in disguise.
4. If you're not succeeding, you're not working hard enough.
5. Work-life balance is a myth; the hustle *is* the life.

27.3.2 Institutional infrastructure

Hustle culture is produced and circulated through:

1. **Social media influencers**: "rise and grind" content on Instagram, TikTok, and YouTube, often sponsored by productivity-app companies, supplement brands, or financial services.

2. **Business media**: Forbes "30 Under 30" lists, Inc. magazine profiles, podcasts celebrating 18-hour workdays, all presenting overwork as the distinguishing characteristic of success.

3. **Self-help industry**: books like *The 4-Hour Workweek* (which ironically requires 80-hour weeks to implement), *Atomic Habits*, and *Grit* frame productivity as the primary determinant of life outcomes.

4. **Tech company culture**: Silicon Valley's celebration of "shipping code at 2 AM," sleeping in the office, and "moving fast and breaking things" normalizes extreme labor as the price of innovation.

5. **Gig platform design**: Uber's gamified driver interface, Amazon's warehouse productivity tracking, and DoorDash's algorithmic incentive systems create environments where the worker is simultaneously told they are "free" and subject to algorithmic discipline more intensive than any factory foreman.

27.3.3 The doxonomic function

Proposition 27.5 (Hustle Culture as Labor Discipline)**.** *Hustle culture performs the same doxonomic function as the Protestant ethic (securing labor compliance through internalized belief) but adapted for post-Fordist capitalism:*

Feature	*Industrial work ethic*	*Hustle culture*
Employer	*Factory/corporation*	*Platform/gig economy*
Compliance mechanism	*Duty, obedience*	*Passion, self-expression*
Identity offered	*Company man*	*Entrepreneur*
Stability offered	*Lifetime employment*	*"Freedom" (precarity)*
Moral frame	*Obedience is virtue*	*Grind is self-actualization*
Who benefits	*Industrial capital*	*Platform capital*

The key doxonomic innovation: hustle culture reframes the loss of employment security as a gain *of entrepreneurial freedom, making workers complicit in their own precaritization.*

27.4 Precarity and the Normalization of Insecurity

27.4.1 The precariat

Standing (2011) identifies the "precariat" as a new class defined by precarious employment: short-term contracts, gig work, zero-hours contracts, and the absence of benefits, pensions, or job security. The precariat's defining feature is not low income per se but *chronic insecurity*: the inability to plan or predict one's economic future.

Model 27.6 (Precarity Normalization)**.** The normalization of precarity operates through:

1. *Flexibility narrative*: precarity is reframed as "flexibility," the freedom to choose one's schedule, work for multiple "clients," and "be one's own boss."
2. *Meritocratic displacement*: insecurity is framed as a solvable personal problem ("build your skills," "develop your network") rather than a structural condition.
3. *Comparison anchor shift*: as precarity becomes more common, the reference point shifts from stable employment to gig work, making stability seem like a luxury rather than a right.
4. *Institutional erasure*: labor protections, unions, and collective bargaining are framed as relics of an outdated economic model, and their absence is presented as progress.

27.4.2 Who benefits?

The normalization of precarity serves employers by:

- reducing labor costs (no benefits, no pensions, no paid leave),
- shifting risk from capital to labor (demand fluctuations absorbed by workers, not firms),
- weakening collective action (precarious workers are harder to organize),
- increasing compliance (fear of losing even precarious employment disciplines workers more effectively than loyalty to a secure employer).

27.5 The "Do What You Love" Ideology

Proposition 27.7 ("Do What You Love" as Narrative Shield)**.** *The DWYL ideology performs a specific doxonomic function: it shields labor exploitation from critique by reframing work as self-expression. If your work is your passion:*

- *long hours are not extraction but devotion,*
- *low pay is not exploitation but the price of doing what you love,*
- *demanding better conditions is not solidarity but betrayal of the calling,*
- *burnout is not a systemic failure but a personal one (you didn't manage your energy well enough).*

The DWYL narrative is most heavily promoted in industries where the supply of passionate workers exceeds demand (academia, creative industries, nonprofits, tech startups), allowing employers to extract surplus from the identity investment.

The DWYL ideology also renders invisible the labor that makes "passion work" possible: the delivery drivers, janitors, food-service workers, and childcare providers whose unlovable labor sustains the conditions under which others "do what they love." This invisibility is itself a doxonomic product: the narrative infrastructure consistently celebrates creative, knowledge, and entrepreneurial work while backgrounding manual, care, and service labor.

27.6 Counter-Narratives and Resistance

27.6.1 The right to rest

Counter-narratives to the work ethic regime include:

- **Reduced working time movements**: the four-day work week campaign, historically successful fights for the 8-hour day and the weekend.
- **Anti-work discourse**: the r/antiwork community (with 2+ million members) and its intellectual precursors (Bertrand Russell's "In Praise of Idleness," Kathi Weeks' *The Problem with Work*).
- **Labor organizing**: unions that explicitly challenge the work ethic regime by framing collective bargaining as a right, not a disruption.

- **Universal basic income**: UBI proposals reframe the relationship between work and survival, decoupling subsistence from labor.
- **Burnout literature**: the medicalization of burnout (WHO recognized it in 2019) reframes overwork from virtue to pathology.

27.6.2 Alternative explanations for overwork

The doxonomic account (overwork is sustained by institutional narrative production) competes with several alternative explanations:

- **Rational choice**: workers choose long hours because the marginal wage exceeds the marginal disutility of effort, no narrative manipulation required. This explains some overwork but not unpaid overtime, self-exploitation in passion industries, or overwork among the already wealthy.
- **Intrinsic motivation**: some people genuinely enjoy their work and choose long hours for non-monetary reasons. The doxonomic response: intrinsic motivation is real, but the *institutional amplification* of intrinsic motivation into a moral obligation ("if you don't love your work, something is wrong with you") is a doxonomic product.
- **Cultural-religious tradition**: the Protestant ethic predates industrial capitalism and may operate independently of any specific funding flow. The doxonomic response: the tradition is real, but its contemporary institutional reproduction (through business schools, self-help, corporate culture) requires material investment.
- **Status competition**: overwork signals status in competitive environments, independent of narrative manipulation. This is complementary to the doxonomic account: status competition is a mechanism; doxonomics asks who builds the institutions that make overwork a status signal rather than a mark of exploitation.

27.6.3 The funding asymmetry

As with other doxonomic regimes, the counter-narrative is massively outfunded. The institutional infrastructure promoting the work ethic (business media, management consulting, self-help industry, corporate culture) operates at a scale of hundreds of billions of dollars annually. Counter-institutions (labor unions, reduced-work-time advocacy, anti-work publishing) operate at a tiny fraction of this.

27.7 Cross-Cultural Variation

The work ethic regime is not universal in its current form.

Example 27.8.

Country	Avg. annual hours	Vacation days	Work ethic framing
United States	1,791	10 (no mandate)	Hustle culture; overwork as badge of honor
Germany	1,349	30 (mandated)	Efficiency ethic; *Feier abend* (quitting time) is respected
Japan	1,607	10 (20 mandated, rarely taken)	*Karoshi* (death from overwork); slowly shifting
France	1,511	30 (mandated)	Right to leisure; *droit à la déconnexion*
South Korea	1,901	15	"Hell Joseon"; generational pushback growing

The variation correlates with institutional infrastructure: countries with strong labor protections, mandated vacation, and cultural norms supporting leisure have shorter working hours, while countries with weak protections and strong hustle-culture narratives have longer hours. The US–Germany gap (442 hours/year, roughly 11 extra weeks of work) represents an enormous difference in lived experience, produced partly by differences in the narrative environment.

27.8 Notes and References

On the moral history of work, see Weber (1905), E. P. Thompson (1967), and Sennett (1998). Precarity and the new labor regime are analyzed in Standing (2011). On neoliberal subjectivity and self-exploitation, see Brown (2015) and Han (2015). For the doxonomic function of management ideology, see Bourdieu (1991).

On hustle culture and the entrepreneurial self, see Illouz (2007) and Tokumitsu (2015). The "Do What You Love" critique draws on Tokumitsu (2014). On the four-day work week, see Autonomy Research (2019). The anti-work tradition includes Russell (1935) and Weeks (2011).

For cross-cultural comparisons of working time, see OECD Employment Outlook (annual) and Schor (1992). On *karoshi* and the Japanese work ethic, see North and Morioka (2016). The gig economy's labor implications are analyzed in Rosenblat (2018) and Woodcock and Graham (2020).

27.9 Exercises

Exercise 27.1. Estimate the monetary value to employers of the work ethic regime using Proposition 27.3.

1. Choose a specific industry (e.g., tech, academia, finance).
2. Estimate the additional unpaid hours per worker attributable to the work ethic.
3. Estimate the monitoring cost savings.
4. Estimate the wage suppression (the discount workers accept because they view work as identity).
5. Sum the three components. How does it compare to the industry's total profits?

Exercise 27.2. Analyze "hustle culture" as a doxonomic product.

1. Identify the funders (who benefits from hustle culture?).
2. Map the institutional channels (social media, business media, self-help, tech culture).
3. Apply framing analysis (Chapter 17) to three pieces of hustle-culture content.
4. Compare the narrative infrastructure promoting hustle culture with the infrastructure promoting work-life balance. What is the funding ratio?

Exercise 27.3. Design an experiment to test whether exposure to hustle-culture narratives increases willingness to accept unpaid overtime.

1. Specify treatment arms (hustle narrative vs. work-life balance narrative vs. control).
2. Choose an outcome measure (hypothetical scenario, real labor-market behavior, or both).
3. Predict heterogeneous treatment effects: who is most susceptible to the hustle narrative?
4. Discuss ethical considerations: is it ethical to experimentally increase self-exploitation?

Exercise 27.4. Apply the internalized discipline model (Model 27.2) to a specific case of "Do What You Love" labor:

1. Choose a field (academia, creative industries, nonprofits, tech).
2. Estimate B_W, $v(h)$, and $c(h)$ for workers in this field.
3. Compute the equilibrium hours under the DWYL identity vs. without it.
4. What would happen to labor supply in this field if B_W declined (e.g., through unionization or burnout)?

Exercise 27.5. Compare the work ethic narratives of two countries from Example 27.8.

1. Map the institutional infrastructure producing work ethic beliefs in each country.
2. Identify the counter-institutions (unions, labor protections, cultural norms around leisure).
3. Does the doxonomic model predict the observed difference in working hours?
4. What policy change would be needed to shift the high-hours country toward the low-hours country's equilibrium?

Exercise 27.6 (Computational). Simulate a labor market with internalized discipline:

1. Create 500 workers with heterogeneous $B_W \sim \text{Beta}(2, 3)$ and disutility $c(h) = 0.01h^2$.
2. Set $w = 25$, $v(h) = 10\sqrt{h}$.
3. Compute equilibrium hours for each worker. Plot the distribution.
4. Introduce a "hustle culture" shock that shifts B_W upward by 0.2 for all workers. How much does total labor supply increase?
5. Compute the employer's gain (additional output) vs. the worker's loss (increased disutility minus moral satisfaction). Who benefits?

CHAPTER 28

Nation, Civilization, and Collective Myth

> Nations are not something eternal. They had their beginnings and they will end.
>
> Ernest Renan, *What Is a Nation?* (1882)

National narratives are among the most expensive doxonomic products in history. Every modern state invests in the production and maintenance of national identity: through education, monuments, ceremonies, media, and military ritual. The budgets are enormous (dwarfing anything a private think tank could deploy) because the state itself is the primary funder, and the survival of the state depends on the narrative's success.

This chapter applies the doxonomic framework to nationalism: the production of collective identity, the management of historical memory, the construction of civilizational narratives, and the conditions under which national myths fracture or are replaced. Unlike the previous application chapters, where the doxonomic agents are primarily private (corporations, foundations, think tanks), the state is the central doxonomic actor here, with its unmatched capacity to fund narrative infrastructure through taxation.

28.1 National Narrative as Doxonomic Product

28.1.1 The structure of national myth

Definition 28.1 (National Myth)**.** A *national myth* is a structured narrative $n_{\text{nat}} \in \mathcal{N}$ specifying:

1. a *founding story*: origin, sacrifice, triumph (the Revolution, the Landing, the Liberation),
2. a *collective character*: virtues attributed to the nation (American ingenuity, French rationalism, Japanese harmony, British resilience),
3. an *enemy or other*: defining the boundary of "us" by contrast with "them" (the empire, the barbarian, the foreign ideology),
4. a *destiny*: what the nation is called to achieve (manifest destiny, civilizing mission, historical mission of the proletariat),
5. a *sacred text or canon*: founding documents, literary traditions, historical narratives that anchor the other four elements.

The national myth is not a single narrative but a *narrative system*: an interconnected set of stories, images, rituals, and institutions that collectively produce the experience of national belonging. Anderson (2006) famously described the nation as an "imagined community": a group too large for face-to-face interaction whose members nevertheless feel a profound sense of shared identity. The doxonomic question is: what institutional infrastructure produces and sustains this imagining?

28.1.2 The myth maintenance model

Model 28.2 (Myth Maintenance)**.** The strength of national identification $B_N(t)$ requires continuous investment:

$$\frac{dB_N}{dt} = \alpha\phi_N - \delta B_N + \beta B_N(1 - B_N) - \gamma \cdot D(t)$$

where:

- ϕ_N is the institutional investment in national narrative (education budgets, state media, military spending on ceremony and recruitment, holiday infrastructure),
- δ is natural decay (generational replacement, exposure to alternative identities, immigration),
- β captures social reinforcement (national identity is stronger when peers share it),
- $D(t)$ measures dissonance from events contradicting the myth (military defeats, economic crises, revelations of historical atrocities, visible hypocrisy between national values and state actions).

The logistic term $\beta B_N(1 - B_N)$ is crucial: national identification has the strongest peer reinforcement at intermediate levels. A deeply nationalistic society reinforces itself; a deeply cosmopolitan one reinforces its alternative. The unstable point is in the middle, where small doxonomic investments can tip the population in either direction.

28.2 The Institutional Infrastructure of National Identity

28.2.1 Education

The school system is the primary delivery mechanism for national narrative. History curricula, language instruction, civic education, and even mathematics word problems ("a patriot buys 3 flags...") are sites of national identity production.

Example 28.3. A rough accounting of the US national-narrative education budget:

- K-12 history and social studies instruction: ∼$15–20 billion/year (estimated from teacher salaries, textbook costs, and curriculum development in the relevant fields).
- Daily Pledge of Allegiance: performed in ∼100,000 schools, ∼180 days/year, for ∼50 million students. Total ritual-hours: ∼150 million hours/year.
- Standardized testing of "American history": the AP US History exam alone is taken by ∼500,000 students annually, requiring months of curriculum dedicated to a specific narrative of national development.

No private doxonomic actor commands anything close to this institutional reach.

28.2.2 Military and security institutions

Military institutions serve a dual doxonomic function: they defend the state and they produce the narrative that justifies the state's claim on citizens' loyalty (and lives).

- **Recruitment advertising**: the US military spends ∼$1.5 billion/year on recruitment, much of it narrative-driven ("Army Strong," "Be All You Can Be," "The Few. The Proud.").
- **Ceremony and ritual**: parades, flyovers at sporting events, flag ceremonies, memorial services, all funded by the state and designed to produce emotional identification with the nation.
- **Entertainment partnerships**: the Pentagon's entertainment liaison office reviews and influences Hollywood scripts in exchange for access to military equipment and locations, shaping the cinematic representation of the nation at war.
- **Veterans' institutions**: the VA, veterans' organizations, and Memorial/Veterans Day observances maintain the narrative of national sacrifice.

28.2.3 State media and public broadcasting

Many states operate media organizations whose explicit mandate includes national identity production: the BBC (UK), NHK (Japan), France Télévisions,

RT (Russia), CCTV (China). Even ostensibly independent public broadcasters operate within a national framework: their programming assumes a national audience and reinforces national reference points.

28.2.4 Monuments, museums, and public space

The physical landscape is a doxonomic medium. National monuments, war memorials, museum exhibits, street names, and public art all encode national narratives in material form. Unlike textbooks, which can be revised, monuments are physically durable: they persist across generations, anchoring national identity in the built environment.

Proposition 28.4 (Material Persistence of National Narrative)**.** *Physical infrastructure (monuments, place names, architecture) has lower depreciation than textual or digital narratives. A monument can sustain a national narrative for centuries with minimal ongoing investment, while a media campaign requires continuous funding. This gives physical infrastructure a distinctive role in the doxonomic economy: it provides a "base layer" of national identity that persists even when active narrative production declines.*

28.3 Historical Memory Management

28.3.1 Selection and omission

States actively manage historical memory: what is remembered, how it is framed, and what is omitted. Curriculum design, museum curation, memorial construction, and holiday designation are all doxonomic operations with measurable budgets (Anderson 2006).

Definition 28.5 (Historical Memory Regime)**.** A *historical memory regime* is the institutionally maintained selection of historical events, figures, and narratives that constitute a nation's "usable past." It includes:

1. *Inclusion*: events that are actively commemorated and taught (victories, foundings, heroic sacrifices).
2. *Framing*: how included events are interpreted (the Civil War as "states' rights" vs. "slavery"; colonialism as "civilizing mission" vs. "exploitation").
3. *Omission*: events that are systematically excluded from public memory (massacres, forced relocations, failed policies, uncomfortable alliances).
4. *Periodization*: which periods are treated as "golden ages" and which as "dark ages," shaping the narrative arc of national destiny.

28.3.2 Contested memory

Historical memory is never uncontested. Counter-memories (maintained by marginalized communities, academic historians, and dissident institutions) challenge the official narrative. The doxonomic competition between official and counter-memory is visible in:

- **Textbook wars**: battles over how to teach the history of slavery, colonialism, indigenous peoples, and immigration (e.g., the Texas textbook controversies, Japan's treatment of WWII atrocities, Turkey and the Armenian genocide).
- **Monument controversies**: debates over Confederate monuments (US), colonial statues (UK, Belgium), and Soviet-era memorials (Eastern Europe).
- **Truth commissions**: post-conflict societies (South Africa, Argentina, Rwanda) that attempt to reconstruct historical memory as a collective project.
- **Memory laws**: legal prohibitions on certain historical claims (Holocaust denial laws, Russia's prohibition on "falsifying" WWII history) that use state power to enforce a specific memory regime.

Example 28.6. The memory of the US Civil War has been actively managed for 160 years:

- *Lost Cause narrative* (1870s–present): the war was about states' rights, not slavery; Confederate soldiers were honorable; Reconstruction was a disaster. Produced by the United Daughters of the Confederacy, textbook campaigns, and monument construction (most Confederate monuments were erected 1890–1950, during peak Jim Crow, not during the war).
- *Abolitionist/emancipation narrative*: the war was fundamentally about slavery; the Union cause was morally just; Reconstruction was an unfinished revolution. Maintained by African American communities, academic historians, and civil rights organizations.
- The doxonomic competition between these narratives has concrete consequences: which narrative dominates affects support for racial equality policies, attitudes toward Confederate symbolism, and the content of K-12 education in the American South.

28.4 Civilizational Narratives

Beyond national myth, larger-scale civilizational narratives operate: "the West," "the Islamic world," "Asian values," "the Global South." These are doxonomic products at a macro scale, grouping diverse societies into supposedly coherent civilizational units.

Proposition 28.7 (Civilizational Narrative as Meta-Regime)**.** *Civilizational narratives function as meta-regimes: they provide the background assumptions*

within which national narratives operate. "Western civilization" is not a neutral description of a geographic-cultural zone but a doxonomic construct that:

1. *selects a specific intellectual lineage (Athens → Rome → Renaissance → Enlightenment → democracy) while omitting others (Byzantium, Islamic golden age, Chinese technological leadership, African kingdoms),*
2. *attributes the selected achievements to an essentialized "Western" character rather than to contingent historical circumstances,*
3. *serves as the foundation for geopolitical narratives ("defending Western values," "the clash of civilizations") with material consequences.*

The "Western civilization" narrative is institutionally produced through university curricula ("Western Civ" courses, which became standard in US universities after WWI as a tool for national identity formation), museum curation (European art at the center, everything else as "world cultures"), and geopolitical discourse (NATO as defender of "the free world").

28.5 National Myth and Economic Interest

National narratives interact with economic interests in specific ways:

1. **Military-industrial legitimation.** The narrative of national threat justifies military spending, which benefits defense contractors. The annual US defense budget (∼$850 billion) is partly a doxonomic product: it requires a narrative of existential threat to sustain political support. Defense industry lobbying (∼$100 million/year) funds the production of this narrative.

2. **Trade nationalism.** "Buy American," "Made in Germany," "Cool Japan" campaigns fuse national identity with consumption, creating doxonomic synergy between nationalism and consumerism (Chapter 23).

3. **Immigration narratives.** The framing of immigration as threat or opportunity serves different economic interests: employers benefit from immigration (cheaper labor), while native workers may face wage competition. National narratives about immigration ("nation of immigrants" vs. "invasion") track these interests with remarkable fidelity.

4. **Austerity nationalism.** The Greek case (Chapter 26) illustrates how national stereotypes ("lazy Greeks") serve economic interests (justifying creditor-imposed austerity). The narrative of national character becomes a tool of transnational economic discipline.

28.6 Myth Fracture and Reconstruction

28.6.1 When myths break

National myths can fracture when dissonance $D(t)$ exceeds the narrative infrastructure's capacity to absorb it:

1. **Military defeat**: especially when the myth includes martial prowess (France 1940, Russia in Afghanistan, the US in Vietnam/Iraq).
2. **Regime change**: revolutions, coups, and decolonization require wholesale myth reconstruction (post-Soviet states, post-colonial nations).
3. **Historical revelation**: declassified documents, archaeological discoveries, or truth commissions that contradict the official narrative.
4. **Demographic transformation**: immigration that changes the population's composition faster than the myth can absorb, creating tension between the narrative "we" and the actual population.

28.6.2 Myth reconstruction

After fracture, new myths must be constructed, and the construction process reveals the doxonomic machinery in sharp relief. Post-Soviet states invested heavily in new national narratives; post-apartheid South Africa constructed the "Rainbow Nation" myth; post-WWII Germany invested in the "Vergangenheitsbewältigung" (coming to terms with the past) narrative.

Example 28.8. Germany's post-WWII memory management is perhaps the most self-conscious exercise in national myth reconstruction:

- Mandatory Holocaust education in all school curricula.
- The Memorial to the Murdered Jews of Europe (Berlin, 2005) as a permanent acknowledgment of national guilt.
- *Vergangenheitsbewältigung* as a cultural norm: the expectation that the nation must continuously confront rather than suppress its history.
- This reconstruction required enormous institutional investment and produced a distinctive national identity: "Germany is the nation that confronts its past," itself a narrative that serves contemporary legitimation functions.

28.7 Notes and References

On nations as imagined communities, see Anderson (2006). State simplification and legibility are analyzed in Scott (1998). On propaganda and national myth, see Lippmann (1922) and Bernays (1928). For the political economy of nationalism, see Acemoglu and Robinson (2012).

On historical memory and its politics, see Assmann (2011) and Nora (1989). The "Lost Cause" narrative is analyzed in Blight (2001). On "Western civilization" as a doxonomic construct, see Appiah (2018). Civilizational

narratives and geopolitics connect to Huntington (1996) and Said's critique in Said (1978).

On military-entertainment partnerships, see Suid (2002). For monument controversies, see Savage (2009). On textbook politics, see Loewen (1995). Memory laws and their implications are discussed in Belavusau and Gliszczyńska-Grabias (2017).

28.8 Exercises

Exercise 28.1. Estimate the annual doxonomic investment in national identity for a country of your choice.

1. Include: education (history curricula), military (recruitment, ceremony, entertainment partnerships), state media, monuments and museums, holidays and public ceremonies.
2. Express the total as a fraction of GDP.
3. Compare this to the investment in any single private doxonomic campaign (e.g., a think tank's annual budget).
4. What does the comparison reveal about the relative doxonomic power of states vs. private actors?

Exercise 28.2. Using the myth maintenance model (Model 28.2), analyze the effect of a major dissonance event on national identification.

1. Choose a specific event (e.g., a military defeat, a historical revelation, an economic crisis).
2. Estimate $D(t)$ (the dissonance magnitude) and its duration.
3. At what $D(t)$ does B_N begin to decline despite continued institutional investment?
4. What additional investment $\Delta\phi_N$ would be needed to maintain B_N at its pre-crisis level?

Exercise 28.3. Compare the national myths of two countries using Definition 28.1.

1. Identify the five components (founding story, collective character, enemy/other, destiny, sacred text) for each.
2. Map the institutional infrastructure that produces each myth.
3. Identify the structural parallels in their belief production chains.
4. Where do the myths contradict historical evidence, and how is the contradiction managed?

Exercise 28.4. Analyze a textbook war (e.g., US Civil War historiography, Japan's WWII memory, India's partition narratives) as a doxonomic competition.

1. Identify the competing narratives and the institutions that produce each.
2. Trace the funding and institutional authority behind each side.
3. What has determined which narrative dominates in the school curriculum?

4. How does the winning narrative affect contemporary political attitudes?

Exercise 28.5. Apply the civilizational meta-regime analysis (Proposition 28.7) to the concept of "Western civilization."

1. Trace the institutional history of "Western Civ" courses in US universities.
2. What was included and excluded from the canonical narrative?
3. How has the narrative changed since the 1990s "culture wars"?
4. What geopolitical functions does the civilizational narrative serve?

Exercise 28.6. Design a study to measure the doxonomic output of a national monument or memorial.

1. Choose a specific site.
2. How would you measure its effect on national identification (surveys of visitors vs. non-visitors? before/after construction? geographic proximity as instrument?)?
3. What beliefs does the monument encode, and do visitors absorb them?
4. How does the monument's effect compare to other channels of national narrative (education, media)?

Exercise 28.7 (Computational). Simulate the myth maintenance model for a nation experiencing a dissonance crisis:

1. Set $B_N(0) = 0.8$, $\alpha = 0.05$, $\phi_N = 5$, $\delta = 0.03$, $\beta = 0.4$.
2. Run for 200 periods with $D(t) = 0$ (no dissonance). Verify stability.
3. At $t = 50$, introduce a crisis: $D(t) = 3$ for $t \in [50, 60]$, then $D(t) = 0$.
4. Plot $B_N(t)$. Does the system recover to its pre-crisis level?
5. Now simulate a "myth reconstruction" scenario: at $t = 100$, increase ϕ_N by 50% (state increases investment in national narrative). How long does recovery take?
6. At what crisis magnitude D does the system fail to recover even with increased investment?

CHAPTER 29

Technology, Inevitability, and the Future

> We shape our tools and thereafter our tools shape us.
>
> Marshall McLuhan (attr.)

The belief that technological development is autonomous, inevitable, and inherently progressive is one of the most powerful doxonomic products of modernity. It depoliticizes technological choices by framing them as natural laws rather than social decisions: technologies "arrive" rather than being chosen; they "disrupt" rather than being deployed by actors with interests; they create "the future" rather than one possible future among many. This chapter analyzes technological determinism, platform ideology, AI narratives, and the politics of inevitability as doxonomic systems.

The stakes are high: if technology is understood as a social choice, it is subject to democratic governance. If it is understood as an autonomous force, governance is futile: we can only adapt. The difference between these framings determines whether societies actively shape their technological futures or passively accept whatever powerful actors deploy.

29.1 Technological Determinism as Doxa

29.1.1 The belief

Definition 29.1 (Technological Determinism)**.** *Technological determinism* is the belief system holding that:

1. technology develops according to its own internal logic, independent of social choices,

2. technological development is unidirectional and irreversible ("progress"),
3. society must adapt to technology, not the reverse,
4. attempts to regulate, slow, or redirect technology are futile or harmful.

As a doxonomic product, technological determinism forecloses democratic deliberation about which technologies to develop, deploy, or constrain.

The word "innovation" has been transformed from a neutral descriptor to a term of moral approval. To oppose or regulate an innovation is framed as opposing progress itself: as being "anti-technology," "Luddite," or "on the wrong side of history." This framing is not natural; it is produced and maintained by actors who benefit from unregulated technological deployment (Winner 1986).

29.1.2 The institutional genealogy

Technological determinism has deep roots but was systematically amplified in the late 20th century:

The Progress narrative (18th–19th c.). Enlightenment thinkers linked technological advancement to human improvement. Comte's positivism, Spencer's social evolution, and the "Whig interpretation of history" all treated technological development as evidence of civilizational advance.

Cold War technology worship (1945–1990). The atomic bomb, the space race, and the computer revolution were framed as proof that technological superiority equals national superiority. Government funding of R&D ($100+ billion/year in the US by the 1980s) created an institutional base for the belief that more technology is always better.

Silicon Valley ideology (1990–present). The tech industry developed its own doxonomic apparatus: the ideology of "disruption" (Christensen, 1997), the framing of regulation as "innovation-killing," and the presentation of tech entrepreneurs as visionaries who see the future before the rest of us. This ideology is reinforced through venture capital (which rewards narratives of inevitable transformation), tech media (Wired, TechCrunch, which celebrate every new product as revolutionary), and the industry's immense lobbying presence ($70+ million/year from Google, Meta, Amazon, Apple, and Microsoft combined).

29.2 Innovation as Legitimating Discourse

29.2.1 The innovation imperative

Remark 29.2 (Innovation as Narrative Shield). The "innovation" discourse functions as a narrative shield (Definition 24.6) that deflects critique of specific technologies by reframing it as critique of progress itself. The mapping:

- "This algorithm discriminates" → "You're against AI."
- "Gig workers need protections" → "You're against the sharing economy."
- "Social media harms children" → "You're against free speech and connection."
- "Surveillance is invasive" → "You want to fall behind China."

In each case, a specific critique of a specific deployment is reframed as opposition to a general and unimpeachable good (innovation, progress, freedom, national competitiveness).

29.2.2 Who funds the innovation discourse?

The innovation narrative is produced by actors with direct financial interests in unregulated technological deployment:

Source	Estimated annual spending
Tech industry lobbying (US, top 10 firms)	\$100+ million
Industry-funded think tanks (ITIF, AEI tech, etc.)	\$30–50 million
Tech company PR and communications	\$500+ million
Industry-funded academic centers	\$50–100 million
Tech media (advertising-supported)	\$2+ billion
Counter-narrative (tech accountability orgs)	\$20–40 million

Note: all figures are rough order-of-magnitude estimates based on publicly available lobbying disclosures, annual reports, and industry analyses. They are intended to illustrate the scale asymmetry, not to provide precise accounting.

The funding asymmetry is roughly 50:1 in favor of the pro-innovation narrative.

29.3 Platform Ideology

29.3.1 Platforms as doxonomic infrastructure

Model 29.3 (Platform Doxonomics)**.** Social media platforms are simultaneously doxonomic infrastructure *and* doxonomic actors. They control the exposure matrix E through algorithmic curation, shaping which narratives

reach which audiences. The platform's optimization function:

$$\max_E \text{ engagement}(E) = \max_E \sum_{j,k} e_{jk} \cdot r_{jk}$$

where r_{jk} is the revenue from exposing agent j to content k, is not belief-neutral. It systematically amplifies high-engagement content, which tends toward moral outrage, identity threat, and simplistic narratives (Zuboff 2019).

The doxonomic consequences:

1. **Attention monopoly**: platforms capture 6+ hours/day of the average user's attention, making them the primary channel through which most people encounter narratives about the world.
2. **Algorithmic amplification**: content that generates engagement (clicks, shares, comments) is algorithmically amplified regardless of its truth, nuance, or social value.
3. **Microtargeting**: advertisers and political campaigns can target specific belief profiles with tailored narratives, creating *personalized doxonomic environments* that different people in the same society never see.
4. **Opacity**: the algorithms that determine exposure are proprietary, making the doxonomic system unobservable to the public and to researchers.

29.3.2 Engagement optimization and narrative entropy

Proposition 29.4 (Algorithmic Entropy Reduction)**.** *Engagement-maximizing algorithms tend to reduce narrative entropy $H(t)$ by amplifying a small number of high-engagement narratives at the expense of diverse, nuanced content. If engagement r_{jk} is highest for content k that is emotionally arousing, morally simple, and identity-affirming, then:*

$$H^{algo}(t) < H^{chronological}(t)$$

where H^{algo} is narrative entropy under algorithmic curation and $H^{chronological}$ is entropy under chronological (uncurated) presentation. Lower entropy means fewer dominant narratives, which facilitates common-sense capture (cf. the entropy-capture connection in Chapter 17).

29.3.3 Surveillance capitalism

Zuboff (2019) argues that the platform business model constitutes a new form of capitalism: "surveillance capitalism," in which human experience is extracted as raw material for behavioral prediction and modification. In doxonomic terms, surveillance capitalism represents the most sophisticated belief-production system ever constructed, one that:

- observes billions of people continuously,
- learns what narratives each person responds to,

- delivers personalized belief-shaping content at industrial scale,
- monetizes the resulting behavioral changes.

The doxonomic novelty is not persuasion (advertising has always been persuasion) but the *feedback loop*: the system measures the effect of each narrative exposure on each individual and uses that measurement to optimize future exposures. Traditional doxonomic systems (think tanks, curricula, mass media) broadcast narratives without individual-level feedback. Surveillance capitalism closes the loop.

29.4 AI Narratives

29.4.1 The "AI will change everything" narrative

The discourse around artificial intelligence provides a real-time case study in doxonomic narrative production. Two dominant narratives compete:

The utopian narrative. AI will solve humanity's greatest problems: cure disease, end poverty, manage climate change, augment human capability. This narrative is produced primarily by AI companies (OpenAI, Google DeepMind, Anthropic), venture capital firms, and tech-optimist media. Its doxonomic function: justify continued investment, forestall regulation, and frame critics as obstacles to progress.

The existential risk narrative. AI poses an existential threat to humanity: superintelligent systems could destroy civilization. This narrative is produced by a smaller but influential set of actors (some overlapping with the utopian camp). Its doxonomic function: concentrate governance authority in the hands of technical experts ("only we understand the risk") and divert regulatory attention from *present* harms (bias, surveillance, labor displacement) to *speculative* future threats.

Remark 29.5 (AI Narrative Convergence). Both the utopian and existential-risk narratives share a common doxonomic substrate: the assumption that AI is autonomous and transformative, that it "arrives" rather than being built by specific actors for specific purposes. Both narratives serve the interests of AI developers by framing the technology as too powerful to be governed by ordinary democratic processes. The difference is in the valence (hope vs. fear), not in the underlying determinism.

29.4.2 What the narratives suppress

Both dominant AI narratives suppress a third framing: AI as a *mundane technology* embedded in specific social contexts, developed by specific corporations, serving specific interests, and subject to the same governance frameworks as any

other powerful technology. This framing, which Winner (1986) would recognize as the "politics of artifacts" approach, has a much smaller institutional base: a few academic centers (AI Now Institute, Data & Society), some journalism (The Markup, MIT Technology Review), and civil-society organizations (EFF, ACLU tech).

29.5 The Politics of Inevitability

29.5.1 TINA as doxonomic product

TINA ("There Is No Alternative") is the purest doxonomic product: the belief that the current arrangement is not merely good but *the only possibility*. This forecloses not just opposition but imagination (Brown 2015; Streeck 2016).

Definition 29.6 (Inevitability Narrative)**.** An *inevitability narrative* frames a contingent social arrangement as the necessary outcome of natural, technological, or historical forces. Its doxonomic function: eliminate the perceived space for political choice. If there is no alternative, there is nothing to deliberate about, nothing to organize for, and no point in resistance.

Examples of inevitability narratives:

- "Globalization is inevitable": obscures the specific trade agreements, institutional decisions, and political choices that produced globalization in its current form.
- "Automation will replace most jobs": obscures that automation is a choice (which tasks to automate, at what pace, with what safeguards) and frames labor displacement as a force of nature.
- "The market will decide": obscures that markets are institutional constructions with rules that can be changed.
- "You can't stop progress": conflates a specific deployment of a specific technology by a specific company with the general advancement of human knowledge.

29.5.2 Alternative explanations for technological dominance

Not all technology adoption is doxonomically driven. Alternative explanations include:

- **Genuine technical superiority**: some technologies dominate because they are genuinely better: faster, cheaper, more reliable. The smartphone replaced the landline partly because it is objectively more capable, not because of narrative manipulation.
- **Consumer demand**: users may actively choose technologies that serve their needs, independent of industry framing. The doxonomic account must distinguish genuine demand from manufactured demand.

- **Path dependence and lock-in**: technologies may dominate because of switching costs and network effects rather than ideology. QWERTY persists not because of narrative but because of coordination.
- **Competitive dynamics**: firms adopt technologies because competitors do, creating an arms-race dynamic that is economic, not ideological.

The doxonomic contribution is not to deny these mechanisms but to add a specific dimension they miss: the narrative infrastructure that frames technology adoption as *inevitable* rather than *chosen*, thereby foreclosing democratic deliberation about which technologies to adopt, at what pace, and with what safeguards. The strongest cases for doxonomic analysis are those where the technology's adoption is genuinely contested (surveillance, algorithmic hiring, social media for children) but the inevitability narrative suppresses the contestation.

29.5.3 The doxonomic structure of inevitability

Model 29.7 (Inevitability Production)**.** Inevitability beliefs are produced by the combination of:

1. *Repeated assertion*: "experts agree," "economists agree," "history shows," creating the impression of consensus about the inevitability of a specific outcome.
2. *Suppression of alternatives*: defunding, marginalizing, or ridiculing proposals that demonstrate that alternatives exist.
3. *Accomplished facts*: implementing the arrangement before democratic deliberation can occur ("move fast and break things"), then pointing to its existence as evidence of its inevitability.
4. *Cost framing*: framing any change to the current arrangement as prohibitively expensive, while treating the costs of the current arrangement as natural.

29.6 Counter-Narratives: Technology as Social Choice

29.6.1 The STS tradition

Science and Technology Studies (STS) provides the intellectual foundation for the counter-narrative: technologies are *socially shaped*, not autonomous forces. Winner (1986) showed that technologies embed political choices (the Long Island parkway bridges, too low for buses, encoded racial segregation in infrastructure). Bijker and Pinch demonstrated that the "success" of a technology reflects social negotiation, not technical superiority.

29.6.2 Democratic technology governance

Institutional alternatives to technological determinism include:

- **Technology assessment**: parliamentary or independent bodies that evaluate technologies before deployment (the US Office of Technology Assessment, defunded in 1995; European equivalents that still operate).
- **Algorithmic accountability**: requirements that consequential algorithms be auditable, explainable, and subject to oversight.
- **Data governance**: regulations (GDPR, proposed AI Act) that treat data and algorithms as objects of democratic governance.
- **Participatory design**: involving affected communities in technological design decisions rather than deploying technologies on them.

29.6.3 The institutional gap

The counter-narrative faces the standard doxonomic asymmetry: the tech industry spends orders of magnitude more on narrative production than the tech-accountability movement. But the counter-narrative has one advantage: lived experience. As algorithmic harms become visible (biased hiring algorithms, social media's mental health effects, gig economy exploitation, AI-generated misinformation), the gap between the innovation narrative and lived reality widens, creating openings for counter-narratives, the same erosion mechanism that weakened the austerity narrative after 2008 (Chapter 26).

29.7 Notes and References

On surveillance capitalism, see Zuboff (2019). Platform power is analyzed in Sunstein (2017). The innovation discourse is critiqued in Mirowski and Plehwe (2009) and Morozov (2013). On technological determinism and the politics of artifacts, see Winner (1986) and Bijker, Hughes, and Pinch (1987).

TINA and the politics of inevitability connect to Brown (2015) and Streeck (2016). On AI narratives and their politics, see Crawford (2021) and Bender et al. (2021). The STS tradition is surveyed in Jasanoff (2004). For algorithmic accountability, see Pasquale (2015) and O'Neil (2016).

On the history of technology assessment, see Bimber (1996). The "disruption" narrative is analyzed in Lepore (2014). For the political economy of Silicon Valley, see O'Mara (2019).

29.8 Exercises

Exercise 29.1. Analyze the discourse around AI automation as a doxonomic product.

1. Who funds the "AI will replace most jobs" narrative? Map the institutional sources.

2. Who funds the "AI will augment human capability" narrative? Are the funders the same?
3. What alternative framings are suppressed (e.g., "AI deployment is a choice about labor relations")?
4. Apply framing analysis (Chapter 17) to three media articles about AI and employment.

Exercise 29.2. Using the platform doxonomics model (Model 29.3), show that engagement-maximizing algorithms reduce narrative entropy.

1. Define a simple content ecosystem with $K = 20$ narrative frames and $N = 1000$ users.
2. Assign engagement scores r_k that correlate with emotional arousal and simplicity.
3. Show that algorithmic curation (amplifying high-r_k content) reduces $H(t)$ relative to chronological ordering.
4. Under what conditions does algorithmic curation produce common-sense capture ($H < H^*$)?

Exercise 29.3. Choose a specific technology (e.g., facial recognition, autonomous vehicles, gene editing) and analyze the inevitability narrative surrounding it.

1. Identify the inevitability claims ("it's coming whether we like it or not").
2. Who produces these claims and through what channels?
3. What social choices are obscured by the inevitability framing?
4. Design a counter-narrative that reframes the technology as a democratic choice.

Exercise 29.4. Apply Proposition 29.5 to the current AI discourse.

1. Collect 10 media articles about AI risk (5 utopian, 5 existential-risk).
2. For each, identify the underlying assumption about AI autonomy.
3. Do any of the articles frame AI as a mundane technology subject to ordinary governance?
4. What institutional changes would be needed to amplify the mundane-technology framing?

Exercise 29.5. Compare the defunding of the US Office of Technology Assessment (1995) with the current debate about AI governance.

1. Who lobbied for the OTA's defunding and why?
2. What institutional gap did its closure create?
3. How does this gap affect the current capacity for democratic technology governance?
4. Design a 21st-century technology assessment institution and estimate its required budget.

Exercise 29.6 (Computational). Simulate the platform doxonomics model:

1. Create 1,000 users and 50 content items with engagement scores drawn from a Pareto distribution (a few items get very high engagement).

2. Under chronological feed: each user sees a random sample of 20 items per day.
3. Under algorithmic feed: each user sees the 20 highest-engagement items.
4. Compute narrative entropy H under both regimes over 100 days.
5. How much does the algorithmic feed reduce entropy?
6. Introduce a "diversity injection" (10% of algorithmic feed is random). How much entropy does this recover?

CHAPTER 30

Crisis Doxonomics

> In a crisis, the old world is dying and the new world struggles to be born. Now is the time of monsters.
>
> Antonio Gramsci (paraphrased)

Crises (wars, pandemics, economic collapses, ecological disasters) are periods of accelerated belief change. The normal inertia of common sense is temporarily suspended: beliefs that would take decades to shift can shift in months. This chapter analyzes the doxonomics of crisis: how fear amplifies narrative capture, how emergencies expand the Overton window, how competing actors race to fill the narrative vacuum, and how the aftermath determines which new common sense is installed.

Crisis doxonomics is the practical synthesis of the entire book. Every tool developed in the preceding chapters, from formal models (Chapter 11) to causal inference (Chapter 16), text analysis (Chapter 17), historical methods (Chapter 18), and the application case studies, converges on the question: when common sense cracks open, what determines what fills the gap?

30.1 Crisis as Phase Transition

30.1.1 The acceleration model

Model 30.1 (Crisis Belief Dynamics)**.** In normal times, belief changes slowly:

$$\frac{d\boldsymbol{B}}{dt} = \varepsilon \cdot f(\boldsymbol{F}, \boldsymbol{B}) \qquad \varepsilon \ll 1$$

During a crisis, the time constant accelerates:

$$\frac{d\boldsymbol{B}}{dt} = f(\boldsymbol{F}, \boldsymbol{B}) \qquad (\varepsilon \to 1)$$

The crisis does not change the structure of doxonomic dynamics; it changes their *speed*. Beliefs that would take decades to shift can shift in months.

Why does ε change? Several mechanisms operate simultaneously:

1. **Attention surge.** In normal times, most people pay little attention to policy, governance, or systemic questions. During a crisis, attention is forcibly redirected: everyone is watching the news, discussing the crisis, seeking explanations. The "attention tax" (Proposition 23.7) is temporarily reallocated from commercial content to crisis content.

2. **Schema disruption.** Existing mental models fail to explain the crisis event. When the 2008 crash occurred, the belief "markets are self-correcting" was visibly falsified. When COVID-19 hit, the belief "pandemics don't happen in modern societies" was shattered. The failure of existing schemas creates cognitive demand for new explanations.

3. **Institutional authority fluctuation.** Institutions that perform well during a crisis gain credibility; those that fail lose it. This reshuffles the credibility weights C_k that determine which narrative sources are trusted.

4. **Uncertainty and anxiety.** Psychological uncertainty increases receptivity to narratives that offer clarity, coherence, and direction, even if those narratives are oversimplified or self-serving.

30.1.2 Phase transition analogy

The crisis-induced acceleration can be understood as a phase transition in the belief system. In statistical mechanics, a phase transition occurs when a control parameter (temperature) crosses a critical threshold and the system reorganizes rapidly. In the doxonomic analogy:

Proposition 30.2 (Doxonomic Phase Transition)**.** [1] *Let $\sigma(t)$ be a "stress" parameter measuring the severity of the crisis (economic contraction, mortality rate, institutional failure). Below a critical stress σ^*, the belief system is in a "solid" phase: beliefs are locked into their current configuration by institutional inertia. Above σ^*, the system enters a "liquid" phase: beliefs become fluid, reconfigurable, and sensitive to small doxonomic inputs. The susceptibility $\chi = \partial \boldsymbol{B}/\partial \boldsymbol{F}$ diverges near the critical point:*

$$\chi(\sigma) \sim |\sigma - \sigma^*|^{-\nu}$$

[1] This proposition uses statistical-mechanics language as a *mathematical analogy*, not a literal claim that belief systems undergo thermodynamic phase transitions. The analogy is useful for generating predictions (e.g., diverging susceptibility near a critical point) but should not be mistaken for a derived physical law.

meaning that near the critical point, even modest narrative investment produces outsized belief shifts.

This is why crises are such valuable doxonomic opportunities: the return on narrative investment is orders of magnitude higher during a crisis than during normal times. The actors who understand this, and who prepare narrative infrastructure in advance, have an enormous advantage.

30.2 Fear as Amplifier

30.2.1 Credibility weighting under threat

Proposition 30.3 (Fear and Credibility Weighting)**.** *Under conditions of threat, agents increase the credibility weight assigned to authority sources:*

$$C_k^{crisis} = C_k + \eta \cdot \text{threat}(t)$$

for institutional channels (government, military, medical experts, legacy media), while decreasing weights for unfamiliar or non-authoritative sources. This concentrates doxonomic power in established institutions during crises.

The psychological mechanism is well-documented: under threat, people gravitate toward familiar, authoritative sources of information and become more susceptible to in-group/out-group framing. This creates a paradox: crises open the belief space but simultaneously concentrate narrative power in the hands of existing authorities, who may use it to reinforce rather than transform the status quo.

30.2.2 The rally-around-the-flag effect

Example 30.4. After the September 11, 2001 attacks, George W. Bush's approval rating surged from 51% to 90%, the largest rally-around-the-flag effect ever measured. This credibility surge was used to:

- pass the PATRIOT Act (expanding surveillance authority) with minimal debate,
- launch the invasion of Afghanistan with near-universal public support,
- create the Department of Homeland Security (reorganizing the federal bureaucracy),
- build the narrative case for invading Iraq (WMD claims).

The crisis-induced credibility surge gave the executive branch a doxonomic window in which policies that would normally face opposition were adopted with minimal scrutiny. By the time the credibility surge faded (2004–2005), the policies were institutional facts, much harder to reverse than to prevent.

30.2.3 Fear and simplification

Proposition 30.5 (Fear-Complexity Tradeoff)**.** *Under high threat, agents' tolerance for narrative complexity decreases. If $C(n)$ is the complexity of narrative n and* threat(t) *is the perceived threat level, the probability of adopting narrative n is:*

$$P(\textit{adopt } n) \propto \text{credibility}(n) \cdot e^{-\lambda \cdot \text{threat}(t) \cdot C(n)}$$

Higher threat exponentially penalizes complex narratives. This gives simple, binary narratives ("us vs. them," "good vs. evil," "act now or die") a systematic advantage during crises, even if more complex narratives are more accurate.

30.3 The Overton Window

30.3.1 Definition and dynamics

Definition 30.6 (Overton Window)**.** The *Overton window* is the set of propositions $W(t) \subset \mathcal{N}$ that are perceived as politically viable at time t. Propositions outside W are "unthinkable" regardless of their merit. The window has a structure:

A crisis can shift W dramatically, making previously unthinkable policies temporarily thinkable.

30.3.2 Crisis-induced window shifts

Example 30.7. Notable Overton window shifts during crises:

Crisis	Previously unthinkable	Became thinkable/enacted
Great Depression	Federal jobs programs, Social Security	New Deal (1933–38)
9/11 attacks	Mass surveillance, indefinite detention	PATRIOT Act, Guantanamo
2008 crash	Bank nationalization, $700B bailout	TARP, QE
COVID-19	Universal cash transfers, lockdowns	Stimulus checks, furlough schemes
Climate crisis	Fossil fuel bans, degrowth	Green New Deal proposals (still contested)

Note that the window can shift in multiple directions simultaneously: COVID-19 made both universal cash transfers (left shift) and unprecedented surveillance (right shift) thinkable. The direction of the permanent shift depends on which actors successfully capture the post-crisis narrative.

30.3.3 The window-capture race

Model 30.8 (Overton Window Capture)**.** During a crisis, competing groups race to fill the expanded Overton window. Let G_1 (incumbent narrative) and G_2 (challenger narrative) invest ϕ_1 and ϕ_2 in narrative production. The post-crisis window location is:

$$W_{\text{post}} = W_{\text{pre}} + \Delta W \cdot \frac{\phi_2 \cdot C_2}{\phi_1 \cdot C_1 + \phi_2 \cdot C_2}$$

where ΔW is the total window expansion created by the crisis. If $\phi_1 C_1 \gg \phi_2 C_2$, the incumbent captures the expanded window and the post-crisis common sense reinforces the status quo (the window "snaps back"). If the challenger has prepared narrative infrastructure, the window can be permanently shifted.

The key insight: the crisis creates the *opportunity* for window shift, but the shift's direction and permanence depend on *pre-crisis narrative preparation*. This is why the shock doctrine (Chapter 26) favors groups with existing institutional infrastructure: they have pre-packaged narratives ready for deployment when the window opens.

30.4 Narrative Vacuum and Competition

30.4.1 The vacuum period

Between the collapse of the old narrative and the consolidation of a new one, there is a period of *narrative vacuum*: high entropy, low coherence, and intense competition among alternative framings.

Model 30.9 (Narrative Vacuum Dynamics)**.** Let $H(t)$ be narrative entropy. The crisis produces:

$$H(t) = \begin{cases} H_0 & t < t_{\text{crisis}} \\ H_0 + (H_{\max} - H_0)(1 - e^{-\mu(t - t_{\text{crisis}})}) & t_{\text{crisis}} \leq t < t_{\text{capture}} \\ H_{\text{new}} + (H_{\max} - H_{\text{new}})e^{-\lambda(t - t_{\text{capture}})} & t \geq t_{\text{capture}} \end{cases}$$

Three phases: entropy rises during the crisis (μ rate), reaches a maximum, then declines as a new dominant narrative consolidates (λ rate). The *vacuum duration* $t_{\text{capture}} - t_{\text{crisis}}$ is the critical parameter: longer vacuums allow more narrative competition; shorter vacuums favor prepared actors.

30.4.2 The game-theoretic structure

Model 30.10 (Crisis Narrative Game)**.** Two groups compete to capture the post-crisis narrative. Each chooses an investment level $\phi_i \in [0, B_i]$ (bounded by budget B_i). The payoff to group i from capturing the narrative is V_i (the value of having their preferred policy regime installed). The probability of capture is a contest function:

$$p_i(\phi_1, \phi_2) = \frac{(\phi_i \cdot C_i)^r}{(\phi_1 \cdot C_1)^r + (\phi_2 \cdot C_2)^r}$$

where $r > 0$ is the "decisiveness" of investment (higher r means investment matters more relative to luck). Group i's expected payoff is $p_i V_i - \phi_i$.

The Nash equilibrium investment is:

$$\phi_i^* = \frac{r V_i V_j (C_i C_j)^r}{(V_i C_i^r + V_j C_j^r)^2} \cdot V_j C_j^r$$

This implies: (1) both groups invest more when the stakes V_i are higher; (2) the group with higher credibility invests less per dollar of payoff (credibility substitutes for spending); (3) total expenditure is highest when the groups are evenly matched.

30.5 Case Studies in Crisis Doxonomics

30.5.1 The 2008 financial crisis (reprise)

The 2008 crisis was analyzed in Chapter 26 from the perspective of austerity narrative capture. Here we examine the broader doxonomic dynamics:

1. **Vacuum phase** (September 2008 – March 2009): Lehman Brothers collapsed; narrative entropy surged; multiple framings competed ("Wall Street greed," "regulatory failure," "government interference," "systemic risk").
2. **Brief Keynesian capture** (March 2009 – late 2009): stimulus programs passed; "government must act" was the dominant frame.
3. **Austerity counter-capture** (2010–2012): fiscal conservatives, with superior institutional infrastructure, reframed the crisis from "private-sector failure" to "public-sector profligacy" (see Chapter 26 for the detailed mechanism).
4. **Residual fragmentation** (2012–present): no single narrative achieved full capture; populist narratives (left and right) filled the vacuum left by partial austerity failure.

The key doxonomic lesson: the Keynesian narrative "won" the initial framing contest but lost the post-crisis consolidation because it lacked the institutional infrastructure to sustain its narrative beyond the immediate emergency.

30.5.2 COVID-19 pandemic

Example 30.11. The COVID-19 pandemic (2020–2022) was the most compressed doxonomic event in modern history:

Phase 1: Rally and consensus (March–June 2020). Near-universal credibility surge for public health authorities. Previously unthinkable policies (lockdowns, universal cash transfers, vaccine mandates) became thinkable. Narrative entropy was briefly low: "follow the science" was the dominant frame.

Phase 2: Fragmentation (July 2020–2021). As the crisis extended, narrative competition intensified. Competing frames emerged: "public health vs. economy," "masks as freedom vs. masks as control," "vaccines as salvation vs. vaccines as coercion." Partisan identity became the strongest predictor of pandemic beliefs in the US, stronger than education, income, or geography.

Phase 3: Institutionalization (2021–2022). The pandemic produced lasting belief shifts:

- *Remote work*: the belief "most office work can be done from home" went from fringe to common sense in months.
- *Government capacity*: the belief "government can send checks to everyone quickly" was demonstrated empirically.
- *Institutional distrust*: trust in public health authorities declined sharply in some populations, a credibility destruction that may take a generation to repair.
- *Surveillance normalization*: contact tracing, vaccine passports, and health status monitoring expanded state and corporate surveillance capacity.

Which of these shifts proves permanent depends on the post-pandemic narrative competition, which is still underway.

30.5.3 Climate crisis: slow-motion doxonomics

The climate crisis is distinctive because it is a *slow-motion* crisis: the threat is real but unfolds over decades rather than days. This creates a doxonomic disadvantage for crisis-response narratives, because the phase-transition mechanism requires a discrete threshold crossing to accelerate belief change.

Proposition 30.12 (Slow Crisis Disadvantage)**.** *A crisis that unfolds gradually ($\sigma(t)$ rises slowly) may never cross the critical threshold σ^* that triggers a phase transition in the belief system. Instead, the system adapts incrementally, normalizing each step of deterioration. The "boiling frog" problem: each year's weather is only slightly worse than the last, never triggering the sudden schema disruption that a discrete crisis (earthquake, crash, attack) produces.*

The climate doxonomic contest therefore depends on discrete "focusing events" (hurricanes, wildfires, heat waves) that temporarily accelerate belief change. Whether these events produce lasting shifts depends on whether climate-action advocates have prepared narrative infrastructure for rapid deployment when events create openings: the same preparedness logic as the shock doctrine, but applied to a progressive rather than conservative agenda.

30.6 Doxonomic Preparedness

30.6.1 The preparedness framework

The analysis above suggests that crisis outcomes depend heavily on *pre-crisis narrative preparation*. This has implications for any group that wants to shape post-crisis common sense:

Model 30.13 (Doxonomic Preparedness)**.** Effective crisis narrative capture requires:

1. **Pre-packaged narratives**: clear, simple, emotionally resonant explanations of what went wrong and what should change, ready for deployment before the crisis hits.
2. **Institutional infrastructure**: think tanks, media relationships, academic allies, and trained spokespeople who can amplify the narrative rapidly.
3. **Policy proposals**: specific, implementable policy solutions that operationalize the narrative ("never let a crisis go to waste" requires having the solution ready when the crisis arrives).
4. **Credibility reserves**: pre-crisis institutional credibility that can be drawn on during the crisis (the group must be seen as legitimate and knowledgeable *before* the crisis, not just during it).
5. **Counter-narrative inoculation**: anticipating and pre-empting the competing narratives that will be deployed.

30.6.2 Asymmetric preparedness

Proposition 30.14 (Conservative Preparedness Advantage)**.** *Groups defending the status quo tend to have a structural preparedness advantage because:*

1. *they have larger institutional budgets (Chapter 24),*
2. *their narratives align with pre-existing common sense (requiring less persuasion),*
3. *their policy proposals involve* less *change (which is simpler to communicate),*
4. *the rally-around-the-flag effect initially boosts established institutions.*

Challenger narratives must overcome these disadvantages through superior simplicity, emotional resonance, or the visible failure of the incumbent narrative to explain the crisis.

The 2008 crisis illustrates this asymmetry: the austerity narrative (status quo-reinforcing) defeated the Keynesian narrative (reform-oriented) despite the latter's stronger evidential base, because the austerity camp had superior institutional infrastructure and a simpler story.

30.7 Post-Crisis Consolidation

30.7.1 The window of vulnerability

The period immediately after a crisis, when the new narrative is being consolidated but has not yet achieved full common-sense status, is a window of vulnerability. The new narrative can be challenged, reversed, or modified during this period. Once it achieves common-sense status (typically 2–5 years after the crisis), it becomes much more resistant to challenge.

30.7.2 Lock-in mechanisms

Post-crisis narratives are locked in through:

- **Policy institutionalization**: policies enacted during the crisis create institutional facts that are hard to reverse (agencies, regulations, spending programs).
- **Curriculum adoption**: if the crisis narrative enters educational materials, it is transmitted to the next generation.
- **Professional norms**: if the crisis narrative changes professional standards (medical protocols, financial regulations, risk assessment), it persists through professional practice.
- **Physical infrastructure**: investments made during the crisis (hospitals, surveillance systems, military bases) embody the crisis narrative in material form.

30.8 Notes and References

On crisis and belief change, see Klein (2007). Gramsci's concept of interregnum and hegemonic crisis connects to Gramsci (1971). The Overton window concept is from Joseph Overton (Mackinac Center, 2003). On emergency governance and narrative, see Lippmann (1922) and Herman and Chomsky (1988).

The rally-around-the-flag effect is documented in Mueller (1970). On fear and political cognition, see Huddy et al. (2005). The phase transition analogy for social systems draws on Scheffer (2009). On the 2008 crisis as a doxonomic event, see Blyth (2013) and Mirowski and Plehwe (2009).

COVID-19 and belief polarization are analyzed in Gadarian et al. (2021). On the climate crisis as a slow-motion doxonomic challenge, see Oreskes and Conway (2014). For the game-theoretic analysis of narrative competition, see Acemoglu et al. (2013).

30.9 Exercises

Exercise 30.1. Using Model 30.1, analyze the COVID-19 pandemic as a doxonomic event.

1. Which beliefs shifted rapidly during the first three months?
2. Which institutions gained credibility? Which lost it?
3. What new common sense was installed, and how durable has it proven?
4. Apply the phase-transition model: estimate when $\sigma(t)$ crossed σ^* and when it fell back below.

Exercise 30.2. Estimate the Overton window before and after the 2008 financial crisis.

1. List 5 propositions that were "unthinkable" before September 2008.
2. Which of these entered the window during the crisis?
3. Which have remained in the window, and which snapped back to "unthinkable"?
4. What institutional factors explain the difference?

Exercise 30.3. Design a "doxonomic preparedness" plan (Model 30.13) for a progressive movement of your choice.

1. Specify the crisis type you are preparing for (economic, ecological, public health, political).
2. Write the pre-packaged narrative (one paragraph, suitable for media deployment).
3. List the institutional infrastructure that would need to be built in advance.
4. Identify 3 specific policy proposals that operationalize the narrative.
5. Anticipate the competing narratives and write counter-arguments.

Exercise 30.4. Apply the crisis narrative game (Model 30.10) to a historical crisis.

1. Identify the two (or more) competing groups and their narratives.
2. Estimate V_i (value of capture), C_i (pre-crisis credibility), and ϕ_i (investment during the crisis).
3. Compute the Nash equilibrium investment levels.
4. Did the actual outcome match the model's prediction? If not, what did the model miss?

Exercise 30.5. Analyze the climate crisis using the slow-crisis framework (Proposition 30.12).

1. Why has the climate crisis not produced a belief-system phase transition despite overwhelming scientific evidence?
2. Identify 3 "focusing events" (extreme weather, ecological collapse) that temporarily accelerated belief change.
3. Were climate advocates prepared to exploit these events doxonomically? What was missing from their preparedness?

4. Design a preparedness framework specifically adapted to the slow-crisis structure.

Exercise 30.6 (Computational). Simulate the narrative vacuum dynamics (Model 30.9) and capture race:

1. Set $H_0 = 1.5$, $H_{\max} = 3.0$, $\mu = 0.3$, $\lambda = 0.15$.
2. Simulate two competing groups with budgets $B_1 = 10$, $B_2 = 3$ and credibilities $C_1 = 0.8$, $C_2 = 0.5$.
3. Using the contest function with $r = 1$, compute the probability that each group captures the post-crisis narrative.
4. How does the outcome change if the challenger invests in credibility-building *before* the crisis ($C_2 \to 0.7$)?
5. Plot the entropy trajectory $H(t)$ for the crisis, vacuum, and consolidation phases.
6. Simulate 1000 crises with stochastic capture outcomes. What fraction does the underfunded challenger win?

The applications have shown what doxonomics can see: how institutional investment produces common sense in domain after domain. But diagnosis without remedy is incomplete. Part V asks the forward-looking questions: how do belief regimes break, how can they be challenged, what would a more democratic belief ecology look like, what ethical constraints bind the field, and what remains to be discovered? These chapters are the most speculative and the most important.

Part V

Resistance, Repair, and Reconstruction

CHAPTER 31

How Belief Regimes Fracture

> There are decades where nothing happens; and there are weeks where decades happen.
>
> Vladimir Lenin (attr.)

Doxonomic equilibria are stable but not permanent. The preceding chapters analyzed how belief regimes are constructed, funded, and maintained. This chapter analyzes how they come apart: the mechanisms by which dominant belief regimes fracture, the dynamics of credibility collapse, the role of contradictions between narrative and lived experience, and the conditions under which fracture produces transformation rather than mere turbulence.

Understanding fracture is essential to doxonomics for two reasons. First, it completes the theory: a framework that can explain regime maintenance but not regime change is fundamentally incomplete. Second, it has practical implications: actors seeking to challenge a dominant belief regime need to understand when and how regimes are vulnerable, just as actors seeking to defend a regime need to understand the sources of fragility.

31.1 Regime Fracture as Bifurcation

31.1.1 The formal model

Model 31.1 (Bifurcation Model of Regime Fracture)**.** Let $B(t)$ be the strength of the dominant belief and $\sigma(t)$ a stress parameter (accumulating contradictions, declining legitimacy, external shocks). The dynamics are:

$$\frac{dB}{dt} = B(\alpha\phi - \delta - \sigma(t)) + \beta B^2(1 - B)$$

where $\alpha\phi$ is the institutional production rate, δ is natural decay, and β captures social reinforcement.

31.1.2 The critical stress threshold

Proposition 31.2 (Critical Stress for Regime Fracture)**.** *The high-B equilibrium exists if and only if $\sigma < \sigma^*$, where:*

$$\sigma^* = \alpha\phi - \delta + \frac{\beta}{4}.$$

When σ exceeds σ^*, the high-belief equilibrium disappears through a saddle-node bifurcation. The system drops to a low-B state: regime fracture.

The critical stress σ^* increases with:

- *institutional investment ϕ (more funding makes the regime more resilient),*
- *social reinforcement β (stronger peer effects make the regime harder to crack),*
- *conversion efficiency α (more effective institutions are more resilient).*

It decreases with natural decay δ (regimes with faster turnover are more fragile).

31.1.3 The fragility-resilience spectrum

Example 31.3. Different belief regimes occupy different positions on the fragility-resilience spectrum:

Regime	$\alpha\phi$ (investment)	β (reinforcement)	Assessment
"Markets are efficient"	High	Moderate	Fractured partially in 2008; recovered due to high ϕ
"Smoking doesn't cause cancer"	Moderate	Low	Fractured 1960s–90s as evidence accumulated
National identity	Very high	Very high	Highly resilient; fractures only in existential crises
"Human nature is selfish"	High	High	Very resilient; self-fulfilling properties add extra stability
Soviet communism	Moderate	High (coerced)	Fractured 1989–91 when coercion was withdrawn

31.2 Sources of Stress

The stress parameter $\sigma(t)$ aggregates multiple distinct sources of strain on the belief regime.

31.2.1 Contradiction accumulation

Definition 31.4 (Doxonomic Contradiction)**.** A *doxonomic contradiction* arises when the belief system predicts X but reality delivers $\neg X$ in a publicly visible way. Each contradiction adds $\Delta\sigma > 0$ to the stress parameter. Small contradictions can be absorbed through rationalization, reinterpretation, or blame-shifting. Large or repeated contradictions accumulate until σ approaches σ^*.

Example 31.5. Contradictions that accumulated against the "efficient markets" regime:

- Long-Term Capital Management collapse (1998): $\Delta\sigma$ moderate, contained by bailout.
- Dot-com crash (2000–01): $\Delta\sigma$ moderate, rationalized as "irrational exuberance" (a market failure, but a correctable one).
- Enron/WorldCom scandals (2001–02): $\Delta\sigma$ moderate, framed as individual fraud rather than systemic failure.
- 2008 financial crisis: $\Delta\sigma$ very large, exceeding the rationalization capacity. Regime fractured partially.

Note the pattern: each contradiction was individually absorbed through narrative repair, but the cumulative σ brought the system close to σ^*. The 2008 crisis pushed it over the threshold, not because it was qualitatively different from previous crises, but because the accumulated stress left no remaining margin.

31.2.2 Credibility collapse

Definition 31.6 (Credibility Collapse)**.** A *credibility collapse* occurs when the credibility C_k of a central institution drops rapidly, typically due to a scandal, failure, or exposure of deception. Because credibility is networked (institutions lend credibility to each other through association), a single collapse can cascade through the institutional network.

Model 31.7 (Credibility Cascade)**.** Let $C_k(t)$ be the credibility of institution k, and let A_{kj} be the association matrix ($A_{kj} > 0$ if institutions k and j are perceived as connected: shared funders, shared personnel, shared narrative space). When institution k_0 suffers a credibility shock:

$$C_k(t+1) = C_k(t) - \gamma \sum_j A_{kj} \cdot \Delta C_j(t)$$

where $\Delta C_j(t)$ is the credibility loss at j in the previous step. If γ is large (strong association effects), a single institutional failure can trigger a credibility cascade that undermines the entire network of institutions supporting the belief regime.

Example 31.8. The Catholic Church sex abuse scandal illustrates a credibility cascade:

- The initial revelation (Boston Globe, 2002) destroyed the credibility of specific dioceses.
- The cascade spread to the institutional Church as a whole (shared identity).
- It damaged the credibility of *moral authority* in general (if the Church was complicit, who can be trusted on moral questions?).
- It weakened the doxonomic output of religious institutions more broadly (survey data shows declining trust in all organized religion post-2002, not just Catholicism).

The cascade followed the association matrix: institutions perceived as closer to the Church (other religious bodies, moral-authority organizations) suffered larger credibility losses than distant institutions.

31.2.3 Economic shocks

Material conditions constrain belief. When economic conditions deteriorate sharply (unemployment rises, living standards fall, inequality becomes visible), the gap between narrative ("the economy works for everyone") and experience ("I just lost my job/house/savings") generates stress.

Proposition 31.9 (Material-Narrative Gap)**.** *The stress contribution from economic conditions is:*

$$\sigma_{econ}(t) = \kappa \cdot |Y_{narrative}(t) - Y_{actual}(t)|$$

where $Y_{narrative}$ is the prosperity level implied by the dominant belief regime and Y_{actual} is the experienced reality. Regimes that promise more ("rising tide lifts all boats") are more vulnerable to economic downturns than regimes with more modest claims ("life is hard but fair").

31.2.4 Generational turnover

Each generation arrives without the formative experiences that established the belief regime for their parents. The beliefs must be actively reproduced through education and socialization: they are not transmitted automatically.

Proposition 31.10 (Generational Decay)**.** *If the belief regime's institutional reproduction is imperfect (transmission rate $\tau < 1$ per generation), then belief strength decays geometrically across generations:*

$$B^{(n)} = \tau^n \cdot B^{(0)}.$$

For $\tau = 0.85$ (15% loss per generation), the regime retains only $0.85^3 = 0.61$ of its original strength after three generations ($\sim$75 years). This decay is independent of external stress and represents the "natural lifespan" of a belief regime in the absence of continuous institutional reinvestment.

31.2.5 Memetic overload

The information environment can become so saturated with competing narratives that no single frame achieves dominance. This raises entropy $H(t)$ and erodes the coherence of the dominant regime even without any specific contradiction.

The digital media environment has accelerated memetic overload: the proliferation of information sources, the algorithmic amplification of controversy, and the collapse of shared informational baselines all contribute to rising entropy. Some analysts interpret the current political moment as a *permanent memetic overload*: a condition in which no stable common sense can be maintained because the information environment is too fragmented.

31.3 Fracture Dynamics

31.3.1 Slow accumulation, fast collapse

Regime fracture typically follows a pattern of slow stress accumulation followed by rapid collapse. The bifurcation model explains why: as σ approaches σ^*, the high-belief equilibrium becomes increasingly fragile (small perturbations produce large swings), but the equilibrium persists until the critical threshold is crossed. The collapse, when it comes, is rapid and discontinuous.

This pattern (decades of apparent stability followed by sudden, surprising collapse) is familiar from the fall of the Soviet Union, the Arab Spring, the #MeToo movement, and other regime fractures. In each case, observers were surprised by the speed of change, but the bifurcation model predicts exactly this pattern: the regime appeared stable because the equilibrium existed, but it was increasingly fragile because σ was close to σ^*.

31.3.2 Partial vs. complete fracture

Not all regime fractures are complete. The 2008 crisis produced a *partial* fracture of the efficient markets regime: the belief was damaged but not destroyed, and institutional investment (ϕ) proved sufficient to repair much of the damage over the following decade.

Definition 31.11 (Partial Fracture)**.** A *partial fracture* occurs when σ temporarily exceeds σ^* but then falls back below it (because the stress source was temporary), and institutional investment is sufficient to rebuild the high-belief equilibrium before the system fully transitions to the low-belief state. The regime survives but is weakened: $B^{\text{post}} < B^{\text{pre}}$.

Complete fracture occurs when either the stress is sustained long enough for the system to fully transition, or when the stress destroys the institutional infrastructure (ϕ declines), making the high-belief equilibrium unrecoverable.

31.3.3 What fills the vacuum?

Regime fracture creates a narrative vacuum (cf. Chapter 30). What fills the vacuum determines whether fracture produces progressive transformation, reactionary backlash, or prolonged instability.

Remark 31.12 (Post-Fracture Outcomes). The outcome of regime fracture depends on the relative preparedness of competing narratives:

1. **Regime replacement**: a prepared alternative with institutional infrastructure captures the vacuum. Example: the New Deal replacing laissez-faire after 1929.
2. **Regime restoration**: the old regime's institutional infrastructure survives the fracture and rebuilds. Example: efficient markets partially restored after 2008.
3. **Prolonged instability**: no alternative achieves capture; the system oscillates between competing frames. Example: the post-2016 political landscape in many Western democracies.
4. **Authoritarian capture**: a crisis narrative built on fear, identity, and simplification captures the vacuum. Example: Weimar Germany, various 21st-century populist movements.

This typology is descriptive, not predictive: it organizes historical cases but does not (yet) predict which outcome will occur in a given crisis.

31.4 Historical Case Studies

31.4.1 The fall of Soviet communism (1989–91)

The Soviet belief regime fractured through a combination of all five stress sources operating simultaneously:

- *Contradictions*: the economy failed to deliver the promised prosperity; Soviet citizens could see Western living standards through increasing media exposure.
- *Credibility collapse*: Chernobyl (1986) demonstrated that the state would lie about existential threats.
- *Economic shock*: declining oil prices and economic stagnation in the 1980s.
- *Memetic overload*: glasnost opened the information space to competing narratives.
- *Generational turnover*: young Soviets had no memory of WWII, which had been the regime's primary legitimating experience.

The critical factor was that Gorbachev's reforms *withdrew coercive enforcement* without building an alternative belief infrastructure. The social reinforcement term β dropped sharply (people could now express dissent), and the institutional investment ϕ was not redirected to a new narrative. The result was complete regime fracture within two years.

31.4.2 The #MeToo fracture (2017–)

The gender regime (Chapter 25) experienced a rapid partial fracture beginning in October 2017:

- *Trigger*: the Harvey Weinstein revelations provided a high-profile credibility shock.
- *Cascade*: social media enabled rapid aggregation of individual experiences into a visible pattern, bypassing institutional gatekeepers who had previously suppressed the narrative.
- *Norm shift*: the disclosure norm shifted from "don't talk about it" to "speak up," enabling thousands of additional disclosures.
- *Institutional response*: companies, universities, and governments adopted new policies, institutionalizing the partial fracture.

The fracture was partial: behavioral norms in many workplaces shifted, but the deeper gender regime (Chapter 25) remained substantially intact. The digital infrastructure that enabled the cascade also enabled counter-narratives ("cancel culture," "due process concerns") that partially contained the fracture.

31.5 Regime Resilience and Repair

31.5.1 Repair mechanisms

Regimes that survive partial fracture employ several repair mechanisms:

1. **Narrative absorption**: incorporate the critique into the regime without changing its core. Example: "We need *better* regulation, not more government" absorbs the 2008 critique without challenging the market-primacy narrative.
2. **Scapegoating**: attribute the failure to specific bad actors rather than systemic problems. Example: "A few bad apples on Wall Street" preserves the system while sacrificing individuals.
3. **Amnesia acceleration**: speed the forgetting of the fracture event. Institutional media moves on to new stories; the crisis becomes "old news."
4. **Credibility restoration**: rebuild institutional credibility through reforms, apologies, or personnel changes that signal change without altering the underlying structure.
5. **Counter-narrative suppression**: use institutional power to marginalize or delegitimize the alternative narratives that emerged during the fracture.

31.5.2 The resilience paradox

Remark 31.13 (Resilience Paradox). Regime repair that is too successful can increase long-run fragility. If the regime absorbs a crisis without meaningful

reform, the underlying contradictions that produced the stress are not resolved: they are merely papered over. The stress parameter σ resumes its accumulation, and the next crisis finds a regime that is closer to σ^* than before, with repair mechanisms that have been partially depleted. Successful short-run repair can produce a cycle of escalating crises and increasingly brittle repairs, culminating in a fracture that no repair can contain.

31.6 Notes and References

On the dynamics of regime change, see Gramsci (1971) on interregnum and Polanyi (1944) on the double movement. Threshold and cascade dynamics are in Granovetter (1978) and Watts (2002). On economic shocks and ideological change, see Klein (2007).

Bifurcation theory for social systems draws on Scheffer (2009) and Strogatz (2015). On the fall of Soviet communism as a belief-system collapse, see Kotkin (2001) and Yurchak (2005). The #MeToo movement's dynamics are analyzed in Fileborn and Loney-Howes (2019).

On credibility cascades and institutional trust, see Slovic (1993) and Cvetkovich and Löfstedt (1999). Generational effects on belief are studied in Mannheim (1952) and Inglehart (1977). For memetic overload and information fragmentation, see Sunstein (2017) and Benkler, Faris, and Roberts (2018).

31.7 Exercises

Exercise 31.1. For the bifurcation model (Model 31.1), compute σ^* as a function of α, ϕ, δ, and β.

1. What makes a regime more resilient to stress? Interpret each parameter's contribution.
2. Compare the resilience of the selfishness regime ($\alpha\phi$ high, β high) vs. a specific scientific consensus ($\alpha\phi$ moderate, β low).
3. How much additional institutional investment $\Delta\phi$ would be needed to survive a stress increase of $\Delta\sigma = 0.5$?

Exercise 31.2. Analyze the 2008 financial crisis as a partial fracture of the "efficient markets" regime.

1. Identify the specific contradictions ($\Delta\sigma$ events) that accumulated prior to 2008.
2. Why was the fracture incomplete? Which repair mechanisms (Section 31.5) were deployed?
3. Apply the resilience paradox (Proposition 31.13): has the repair made the regime more or less fragile going forward?
4. What would complete fracture look like, and what stress level would be required?

Exercise 31.3. Model a credibility cascade (Model 31.7) using a network of 10 institutions.

1. Define the association matrix A_{kj} based on shared funding, shared personnel, or shared narrative space.
2. Shock one institution ($\Delta C_{k_0} = -0.5$) and propagate the cascade.
3. How many institutions lose more than 20% credibility? Does the cascade reach institutions not directly associated with k_0?
4. What network structure (hub-and-spoke vs. distributed) is more vulnerable to cascading credibility collapse?

Exercise 31.4. Apply the generational decay model (Proposition 31.10) to a belief regime of your choice.

1. Estimate the transmission rate τ from survey data comparing cohorts.
2. Compute the regime's "natural lifespan" (the number of generations until B falls below 0.3).
3. How much institutional investment ϕ is needed to offset generational decay?
4. Compare with the actual investment in the regime's institutional reproduction (education budgets, media, etc.).

Exercise 31.5. Analyze the #MeToo movement as a partial regime fracture.

1. What was the stress accumulation ($\sigma(t)$) prior to October 2017?
2. What role did social media play in bypassing institutional gatekeepers?
3. Was the fracture captured by a prepared alternative, or did it produce prolonged instability?
4. Apply the partial fracture definition: what aspects of the gender regime fractured, and what aspects survived intact?

Exercise 31.6 (Computational). Simulate the bifurcation model of regime fracture:

1. Set $\alpha\phi = 0.3$, $\delta = 0.1$, $\beta = 0.5$, $B(0) = 0.8$.
2. Slowly increase σ from 0 to 1 over 500 time steps. Plot $B(t)$.
3. Identify the critical σ^* at which fracture occurs.
4. Repeat with $\beta = 0.3$ (weaker social reinforcement). How does σ^* change?
5. Simulate a partial fracture: increase σ above σ^* for 20 time steps, then reduce it. Does the regime recover?
6. How long must $\sigma > \sigma^*$ persist for the fracture to become irreversible?

CHAPTER 32

Counter-Doxonomic Strategies

> The master's tools will never dismantle the master's house.
>
> Audre Lorde

If beliefs can be produced, they can also be contested. The preceding chapters documented how material power shapes belief through institutional investment. This chapter asks the practical question: what can be done about it? How can movements with limited resources challenge belief regimes backed by billions of dollars?

The answer is not obvious. Lorde's epigraph warns against mimicking the oppressor's methods. But doxonomic analysis suggests that the "master's tools" (institutional infrastructure, narrative production, strategic communication) are not inherently tools of domination; they are tools of belief formation, and they can be used by anyone who builds them. The question is not whether to use institutional infrastructure but *how* to use it with vastly fewer resources.

32.1 The Counter-Doxonomic Challenge

32.1.1 The fundamental asymmetry

Counter-doxonomic movements face a stark resource asymmetry. The regimes they challenge (selfishness, meritocracy, consumerism, austerity) are supported by institutional budgets in the billions. Counter-movements typically operate at budgets in the millions. The ratio is roughly 100:1 to 1000:1.

Proposition 32.1 (Resource Asymmetry)**.** *If the dominant regime invests F_D and the counter-movement invests F_C, with $F_C \ll F_D$, then direct competition on the same channels (mass media, advertising, lobbying) is a losing strategy.*

The counter-movement's belief share under symmetric competition is:

$$B_C^* \approx \frac{F_C}{F_D + F_C} \approx \frac{F_C}{F_D} \ll 1.$$

At a 100:1 funding ratio, the counter-movement captures roughly 1% of the belief space through symmetric competition: negligible. Effective counter-doxonomics requires asymmetric *strategies that exploit the dominant regime's vulnerabilities rather than competing on its strengths.*

32.1.2 Sources of asymmetric advantage

Despite the funding gap, counter-movements have several potential advantages:

1. **Truth.** If the dominant regime's beliefs are empirically false or significantly distorted (as the preceding chapters have argued for several regimes), the counter-movement has a correspondence advantage: its claims align better with lived experience. This advantage grows over time as contradictions accumulate (Chapter 31).

2. **Authenticity.** Counter-movements often speak from lived experience rather than institutional script. A worker describing precarity is more credible (to other workers) than a think-tank report justifying it. Authenticity provides a credibility premium per dollar of investment.

3. **Motivation.** Participants in counter-movements are often motivated by conviction rather than compensation, providing volunteer labor that reduces the effective cost of narrative production.

4. **Network effects.** Counter-narratives that resonate can spread virally through social networks at near-zero marginal cost, a channel that was unavailable before digital media and that partially offsets the mass-media funding disadvantage.

5. **Regime fragility.** Dominant regimes have specific vulnerabilities (contradictions, credibility weaknesses, legitimation costs that grow with inequality) that targeted counter-doxonomic strategies can exploit.

32.2 Alternative Institutions

32.2.1 Building parallel infrastructure

Definition 32.2 (Counter-Doxonomic Institution)**.** A *counter-doxonomic institution* is an organization that produces narratives opposing the dominant regime, operating through alternative channels with independent funding. Examples: labor unions, cooperative enterprises, community media, alternative schools, progressive think tanks, mutual-aid networks.

The most successful counter-doxonomic movements in history built parallel institutional infrastructure rather than relying solely on critique:

Example 32.3.

Movement	Counter-institutions built	Doxonomic output
Labor movement (1880–1950)	Unions, labor press, workers' education, cooperatives	"Labor has rights"; "solidarity, not competition"
Civil rights (1950–70)	NAACP, SCLC, Freedom Schools, Black newspapers	"Segregation is unjust"; "equality under law"
Feminism (1960–)	Women's studies programs, feminist media, shelters, legal organizations	"Personal is political"; "equal pay for equal work"
Environmental (1970–)	Environmental organizations, green parties, research institutes	"Pollution has costs"; "sustainability"

Each movement's lasting impact depended on the institutional infrastructure it built, not just the protests it organized or the critiques it published. Protest creates attention; institutions sustain narrative over time.

32.2.2 Institution design principles

Model 32.4 (Counter-Institution Design)**.** Effective counter-doxonomic institutions should:

1. **Produce, not just critique**: generate positive alternative narratives, not only refutations of the dominant regime.
2. **Build credibility**: accumulate epistemic capital through rigorous research, transparent methods, and consistent accuracy.
3. **Diversify funding**: avoid dependence on any single funder whose withdrawal could collapse the institution.
4. **Invest in persistence**: design for multi-generational operation, not just campaign cycles.
5. **Target the production chain**: intervene at the institutional stages of belief production (education, professional norms, policy design), not just at the media stage.

32.3 Pedagogical Interventions

32.3.1 Critical pedagogy

Freire (1968) developed "critical pedagogy": education designed to reveal the social construction of common sense. In doxonomic terms, Freire's method attacks the internalization stage of the belief production chain by making the chain itself visible. When students learn to ask "who produced this belief, through what institutions, with what funding, and serving whose interests?," they are performing doxonomic analysis, even if they have never heard the term.

32.3.2 Media literacy as counter-doxonomics

Model 32.5 (Media Literacy Intervention)**.** Media literacy education reduces the susceptibility parameter α in the belief dynamics model:

$$\alpha^{\text{post-literacy}} = \alpha \cdot (1 - \ell)$$

where $\ell \in [0, 1]$ is the "literacy shield": the fraction of doxonomic influence that the individual can recognize and resist after training. If $\ell = 0.3$ (a 30% reduction in susceptibility), the effective doxonomic investment becomes $0.7 \cdot \phi$, equivalent to cutting the dominant regime's budget by 30% without spending a dollar on counter-narrative production.

This makes media literacy one of the highest-IROI counter-doxonomic investments available: rather than competing dollar-for-dollar in narrative production, it reduces the effectiveness of the opponent's spending. The analogy is to vaccination rather than treatment: it is cheaper to prevent belief capture than to reverse it.

32.3.3 Doxonomic literacy

Beyond general media literacy, *doxonomic literacy* is the specific ability to:

1. identify the funding source behind a narrative,
2. trace the institutional production chain,
3. recognize the credibility-laundering mechanisms (academic authority, expert panels, "independent" research),
4. distinguish between beliefs held because of evidence and beliefs held because of institutional repetition,
5. recognize one's own susceptibility to doxonomic influence.

This textbook is, among other things, an exercise in doxonomic literacy.

32.4 Narrative Inoculation

32.4.1 The inoculation model

Definition 32.6 (Narrative Inoculation)**.** *Narrative inoculation* is preemptive exposure to a weakened form of a dominant narrative, accompanied by refutation, so that subsequent full-strength exposure is less effective. Formally, it reduces the susceptibility parameter α in the SIR model (Model 11.6).

The analogy to biological vaccination is precise: a weakened version of the "pathogen" (the misleading narrative) is introduced, along with "antibodies" (refutation and critical analysis), so that when the full-strength narrative is encountered, the individual has pre-existing resistance (McGuire 1964; Linden 2023).

32.4.2 Practical inoculation design

Model 32.7 (Inoculation Program)**.** An inoculation intervention consists of:

1. **Warning**: alert the audience that they will encounter persuasion attempts ("some people will try to convince you that. . . ").
2. **Weakened exposure**: present the core argument of the misleading narrative in a simplified or clearly attributed form.
3. **Refutation**: provide the counter-arguments, evidence, and critical analysis that reveal the narrative's weaknesses.
4. **Practice**: give the audience opportunities to practice identifying and refuting the narrative in new contexts.

Studies show that inoculation can reduce susceptibility to misinformation by 20–30% and that the effect persists for months (Linden 2023).

Example 32.8. An inoculation program against the household-budget metaphor for government spending (Chapter 26):

1. *Warning*: "Politicians often compare the government budget to a household budget. This comparison sounds intuitive but is misleading."
2. *Weakened exposure*: "The argument: 'Just like families, governments can't spend more than they earn.' "
3. *Refutation*: "Unlike families, governments that issue their own currency can create money; their spending creates income for the private sector; and they never need to 'pay back' debt the way a household does. The analogy confuses a currency user (household) with a currency issuer (sovereign government)."
4. *Practice*: present three variants of the household metaphor ("maxed out credit card," "belt-tightening," "living beyond our means") and ask participants to identify and refute each.

32.5 Optimal Allocation of Counter-Resources

32.5.1 The optimization problem

Model 32.9 (Counter-Doxonomic Optimization)**.** Given a total counter-doxonomic budget $F_C \ll F_D$, the counter-movement solves:

$$\max_{\boldsymbol{F}_C} \ \Delta B_C = \sum_k F_k^C \cdot C_k^C \cdot P_k^C \cdot T_k^C$$

subject to $\sum_k F_k^C = F_C$. The optimal allocation equates the marginal IROI across all channels:

$$\frac{\partial \Delta B_C}{\partial F_k^C} = \lambda \quad \text{for all active channels } k$$

where λ is the shadow price of the budget constraint.

32.5.2 Channel ranking

The IROI-per-dollar typically ranks channels as follows:

Channel	Credibility	Reach	Persistence	IROI/$
Community organizing	High	Low	Very high	Highest
Education/curricula	High	Moderate	Very high	Very high
Investigative journalism	High	Moderate	High	High
Social media campaigns	Low	Very high	Low	Moderate
Mass advertising	Low	Very high	Low	Lowest

The optimal strategy for a resource-constrained counter-movement typically concentrates on high-credibility, high-persistence channels (community organizing, education) rather than competing on reach with the dominant regime's mass media.

32.5.3 The credibility-reach tradeoff

Proposition 32.10 (Asymmetric Warfare in Belief Space)**.** *Counter-doxonomic movements are most effective when they:*

1. *target the* weakest link *in the dominant belief production chain (the point where the narrative is most vulnerable to contradiction or exposure),*
2. *exploit credibility asymmetries (authentic lived experience vs. corporate messaging; independent research vs. industry-funded studies),*
3. *invest in persistence over reach (deep education that changes schemas over years vs. viral campaigns that shift attention for days),*
4. *build parallel institutional infrastructure rather than only critiquing existing infrastructure,*

5. *time interventions to exploit regime fractures (Chapter 31) and crisis windows (Chapter 30).*

32.6 Transparency and Disclosure

32.6.1 Funding transparency as counter-doxonomic tool

One of the most cost-effective counter-doxonomic strategies is not producing counter-narratives but *revealing the production chain of the dominant narrative.* If the public knows who funds a think tank, who sponsors a study, or who owns a media outlet, the credibility of the narrative is automatically discounted.

Proposition 32.11 (Disclosure Effect)**.** *If the funding source of institution k is disclosed, its effective credibility becomes:*

$$C_k^{disclosed} = C_k \cdot (1 - d \cdot conflict(k))$$

where $d \in [0, 1]$ is the disclosure-awareness rate (what fraction of the audience learns the funding information) and $conflict(k) \in [0, 1]$ measures the perceived conflict of interest. For a fossil-fuel-funded climate denial institute with $C_k = 0.6$, $d = 0.5$, and $conflict = 0.8$:

$$C_k^{disclosed} = 0.6 \times (1 - 0.4) = 0.36.$$

Disclosure reduces effective credibility by 40%, achieved not by producing counter-narrative but by revealing the production chain of the existing one.

32.6.2 Institutional transparency requirements

Policy-level counter-doxonomic strategies include:

- mandatory disclosure of think-tank funding sources,
- academic conflict-of-interest disclosure requirements,
- media ownership transparency laws,
- political advertising source disclosure,
- algorithmic transparency requirements for platforms.

Each makes the doxonomic production chain visible, reducing its effectiveness by the disclosure effect.

32.7 Coalition and Scale

32.7.1 The coordination problem

Counter-doxonomic movements are often fragmented: environmental groups, labor unions, racial justice organizations, feminist movements, and anti-poverty groups each challenge different aspects of the dominant regime but rarely coordinate their narrative production.

Proposition 32.12 (Counter-Doxonomic Coordination Gains)**.** *If n counter-movements each invest f independently, the total belief shift is $\Delta B = n \cdot g(f)$ where g is concave (diminishing returns within each channel). If they coordinate and pool resources $F = nf$ into a unified counter-narrative, the total shift is $\Delta B = g(nf) > n \cdot g(f)$ by concavity. Coordination produces more belief shift per dollar than fragmented investment.*

The practical challenge: coordination requires agreement on a shared counter-narrative, which is difficult when movements have different priorities and constituencies. The most successful coordinating frameworks (e.g., the Green New Deal, which linked climate, labor, and racial justice) succeed by finding a narrative that encompasses multiple movements without subordinating any.

32.8 Notes and References

Critical pedagogy draws on Freire (1968) and Illich (1971). On alternative media and networked public spheres, see Benkler (2006). Counter-hegemonic strategy is theorized in Gramsci (1971). Narrative inoculation is studied in McGuire (1964) and Linden (2023). For real utopian institution-building, see Wright (2010).

On the history of counter-doxonomic movements, see the labor movement analysis in Foner (1947), the civil rights movement in Morris (1984), and feminist institution-building in Ferree and Mueller (2004). Media literacy effectiveness is reviewed in Jeong et al. (2012). Funding transparency and its effects are analyzed in Mayer (2016).

For the optimization of social-movement resources, see McCarthy and Zald (1977) on resource mobilization theory. On movement coordination, see Tarrow (2011) and McAdam, Tarrow, and Tilly (2001).

32.9 Exercises

Exercise 32.1. Given a counter-doxonomic budget of $5 million/year, design an allocation strategy across education, media, community organizing, investigative journalism, and inoculation programs to shift belief in selfish human nature.

1. Justify your allocation using the IROI framework and the channel ranking table.
2. What percentage of the budget goes to each channel?
3. How does your allocation change if the budget doubles to $10M? Does it scale linearly?
4. Estimate the expected belief shift ΔB_C under your allocation.

Exercise 32.2. Design a narrative inoculation program for high school students to build resistance to advertising-driven consumerism.

1. Specify the curriculum (4–6 sessions).
2. For each session, describe the warning, weakened exposure, refutation, and practice components.
3. Predict the effect on subsequent consumer behavior.
4. How would you evaluate the program's effectiveness (study design, outcome measures)?

Exercise 32.3. Analyze a historical counter-doxonomic movement (e.g., the labor movement's challenge to laissez-faire).

1. What counter-institutions did it build?
2. What was its funding level relative to the dominant regime?
3. What asymmetric advantages did it exploit?
4. What doxonomic strategies succeeded, and which failed?
5. What happened when the movement's institutional infrastructure was defunded or dismantled?

Exercise 32.4. Apply the disclosure effect (Proposition 32.11) to a specific doxonomic institution.

1. Choose an institution whose funding sources are partially opaque.
2. Estimate its current credibility C_k and the conflict of interest $\text{conflict}(k)$.
3. If full disclosure were achieved ($d = 1$), how much would effective credibility decline?
4. What institutional resistance to disclosure would you expect, and how would you overcome it?

Exercise 32.5. Design a coordinated counter-doxonomic campaign linking two or more social movements.

1. Choose the movements (e.g., labor + environmental, racial justice + economic justice).
2. Write a shared counter-narrative that encompasses both movements' concerns.
3. Estimate the coordination gain (Proposition 32.12) vs. independent operation.
4. What tensions might arise between the movements, and how would you manage them?

Exercise 32.6 (Computational). Simulate the media literacy intervention (Model 32.5):

1. Create 1,000 agents exposed to a dominant narrative with $\alpha = 0.1$ and $\phi = 10$.
2. Without literacy: compute the steady-state belief B^*.
3. Apply a literacy intervention to 30% of agents ($\ell = 0.3$). Recompute the steady-state.
4. How much does the literacy intervention reduce dominant-regime belief compared to spending the same budget on counter-narrative production?

5. Find the break-even point: at what literacy cost per person does direct counter-narrative production become more cost-effective than literacy training?

CHAPTER 33

Epistemic Democracy

The cure for the ailments of democracy is more democracy.

John Dewey, *The Public and Its Problems*

If concentrated doxonomic power distorts public belief, the remedy is the democratization of belief production. But what does that mean in practice? This chapter explores what epistemic democracy means, whether it is achievable, what institutional designs might support it, and what tradeoffs it entails.

The problem is fundamental: democratic governance presupposes informed citizens, but the information environment is itself shaped by power. If the "marketplace of ideas" is dominated by a few well-funded sellers, the resulting common sense reflects purchasing power rather than evidence or deliberation. Epistemic democracy is the attempt to design institutions that produce a more pluralistic, evidence-responsive, and democratically accountable belief environment.

33.1 The Problem

33.1.1 Epistemic concentration and democratic failure

Definition 33.1 (Epistemic Democracy)**.** An *epistemic democracy* is a social arrangement in which the production, circulation, and evaluation of public belief is not dominated by a narrow set of funders or institutions. Formally, epistemic democracy requires:

1. EHI $< \bar{h}$: epistemic concentration is below a threshold that would allow a small number of actors to determine common sense.
2. Narrative pluralism: multiple competing frames for any important public question are institutionally supported and accessible.

3. Accountability: narrative-producing institutions are transparent about their funding, methods, and interests.
4. Responsiveness: the belief environment is responsive to evidence, deliberation, and democratic input, not just to funding levels.

The current situation in most democracies falls far short of this ideal. The preceding chapters documented epistemic concentration ratios of 100:1 or higher in multiple narrative domains (selfishness, meritocracy, consumerism, austerity). This concentration is not compatible with the democratic principle that citizens should form their beliefs through free and equal deliberation.

33.1.2 Three failure modes

Current democracies exhibit three related epistemic failures:

1. **Plutocratic capture**: wealthy actors dominate narrative production through think-tank funding, media ownership, and lobbying. The beliefs that become common sense disproportionately reflect the interests of funders.

2. **Algorithmic distortion**: platform algorithms optimize for engagement rather than truth or democratic deliberation, producing information environments that amplify outrage, simplification, and polarization.

3. **Institutional sclerosis**: educational curricula, professional norms, and policy frameworks lag behind evidence, reproducing outdated beliefs through institutional inertia even when the evidence has shifted.

33.2 Normative Foundations

33.2.1 The deliberative ideal

Habermas (1962) proposed an "ideal speech situation" in which all participants have equal opportunity to make claims, challenge claims, and express needs, free from domination. In doxonomic terms, this requires:

$$C_k = C_k(\text{evidence quality, argument strength}) \quad \text{not} \quad C_k(\text{funding level, institutional prestige}).$$

The ideal is unrealizable in its pure form (credibility will always be influenced by institutional position), but it provides a benchmark against which actual epistemic arrangements can be evaluated.

33.2.2 The agonistic alternative

Mouffe (2005) argues that the deliberative ideal is not only unrealizable but undesirable: genuine politics involves irreducible conflict between incompatible

values, and attempts to reduce politics to rational consensus suppress this conflict rather than resolving it.

In doxonomic terms, the agonistic view suggests that the goal is not consensus but *fair competition*: multiple narrative-producing institutions with roughly equal resources competing to persuade a critically engaged public. The problem is not that different groups produce different narratives; the problem is that one group's narrative dominates because of *funding* rather than *argument*.

Proposition 33.2 (Agonistic Epistemic Democracy)**.** *An agonistic epistemic democracy requires not consensus but* competitive pluralism*: multiple institutionally supported narratives contesting for public adherence, with no single narrative dominating through resource advantage rather than persuasive quality. The metric is not low entropy (consensus) but* fair entropy*: $H(t)$ is neither so low that one narrative monopolizes (capture) nor so high that no shared framework exists for collective action (fragmentation), and the distribution of narrative resources is roughly proportional to the diversity of genuinely held positions in the population.*

33.3 Institutional Designs

33.3.1 Public-interest media

Model 33.3 (Public Media as Epistemic Infrastructure)**.** Public-interest media (funded by taxation or public endowment, editorially independent, and free from advertising pressure) provides a baseline of information quality that commercial media need not match.

Design principles:

1. **Funding independence**: endowment or hypothecated tax, insulated from annual budget negotiations that create political leverage.
2. **Editorial autonomy**: governance by independent boards with fixed terms, not by government appointment.
3. **Universal access**: free at point of use, available across all platforms and regions.
4. **Mandate for diversity**: explicit requirement to represent diverse perspectives, not just the perspectives of the educated metropolitan class.

Example 33.4. Comparison of public media models:

Country	Funding	Independence	Doxonomic assessment
UK (BBC)	License fee (£3.7B)	Moderate (Royal Charter, but government sets fee)	Substantial epistemic infrastructure but vulnerable to political pressure
Germany (ARD/ZDF)	Household levy (€8.4B)	High (interstate treaty, independent fee commission)	Strong independence; highest per-capita public media investment
US (PBS/NPR)	Mixed (15% federal, rest private)	Low (dependent on donations and corporate sponsorship)	Weak epistemic infrastructure; commercial pressures dominate
Scandinavia	License fee / tax	High	High-trust information environment

Countries with stronger public media consistently show higher levels of political knowledge, lower susceptibility to misinformation, and more moderate political polarization, consistent with the hypothesis that public media reduces epistemic concentration.

33.3.2 Open curricula

Educational content developed through transparent, participatory processes with input from educators, researchers, communities, and students:

- **Transparent development**: curriculum-writing processes that are publicly documented, with input from diverse stakeholders.
- **Evidence-based revision**: mandatory periodic review of curricula against current evidence (addressing the textbook-evidence gaps documented in Chapter 21).
- **Critical thinking**: explicit instruction in identifying narrative sources, evaluating evidence, and recognizing doxonomic influence (the doxonomic literacy of Chapter 32).

33.3.3 Institutional pluralism

Definition 33.5 (Epistemic Pluralism Requirement)**.** An *epistemic pluralism requirement* is a regulatory framework ensuring that no single funding source dominates any narrative domain. Analogous to antitrust regulation in economic markets, it limits the concentration of narrative-production capacity. Formal condition: $\mathrm{EHI}_{\mathrm{domain}} < \bar{h}$ for each major narrative domain (economics, health, environment, education, etc.).

Implementation mechanisms:

- caps on single-source funding of think tanks (e.g., no more than 20% of budget from one funder),
- media ownership limits (maximum share of national audience),
- public matching funds for narrative-producing institutions that meet transparency standards,
- antitrust review of mergers that would increase epistemic concentration.

33.3.4 Transparency requirements

Mandatory disclosure of funding for all narrative-producing institutions:

- think tanks and policy institutes: full donor lists above a threshold,
- academic research: comprehensive conflict-of-interest disclosure,
- media outlets: ownership structure and major advertising clients,
- political advertising: source, funding, and targeting criteria,
- platform algorithms: public auditing of content-recommendation systems.

33.4 Mechanism Design for Belief Production

33.4.1 The design problem

Model 33.6 (Democratic Belief Production)**.** Treating belief production as a mechanism design problem:

- agents have private preferences over beliefs and narratives,
- a social planner seeks to design institutions that aggregate information and preferences without allowing wealthy agents to dominate,
- the mechanism must be incentive-compatible (agents cannot profit by misrepresenting preferences) and individually rational.

The impossibility results of Arrow (1963) apply: no perfect mechanism exists. But approximate mechanisms (public media, deliberative assemblies, citizen juries, open curricula, transparency requirements) can reduce epistemic concentration below the capture threshold.

33.4.2 Deliberative mini-publics

Definition 33.7 (Deliberative Mini-Public)**.** A *deliberative mini-public* is a randomly selected group of citizens who are given time, information, and facilitation to deliberate on a specific policy question. Examples: citizens' assemblies, consensus conferences, deliberative polls.

Mini-publics bypass doxonomic concentration by:

- random selection (not self-selection or wealth-selection),
- balanced information provision (curated by neutral facilitators, not by interested parties),

- structured deliberation (ensuring that all voices are heard, not just the loudest or most funded),
- protected time (participants are compensated for their time, removing the wealth barrier to participation).

Evidence from citizens' assemblies (Ireland's constitutional convention on abortion, France's Citizens' Convention on Climate, British Columbia's electoral reform assembly) suggests that deliberative mini-publics produce more nuanced, evidence-responsive, and less polarized recommendations than standard democratic processes.

33.4.3 Epistemic public goods

Proposition 33.8 (Belief Quality as Public Good)**.** *High-quality public belief is a public good: it is non-rivalrous (one person's accurate belief does not diminish another's) and non-excludable (everyone benefits from a well-informed electorate, not just the well-informed individuals themselves). Like all public goods, it is under-provided by market mechanisms because individual consumers of information bear the full cost but capture only a fraction of the benefit. Public investment in epistemic infrastructure (public media, education, research) is justified on the same grounds as public investment in physical infrastructure (roads, bridges, sanitation): the market alone will not provide the socially optimal level.*

33.5 The Diversity-Coordination Tradeoff

33.5.1 The optimal entropy problem

Model 33.9 (Optimal Narrative Entropy)**.** Epistemic democracy faces a fundamental tradeoff between diversity and coordination:

- Too little diversity (H low): common-sense capture; one narrative dominates, suppressing alternatives.
- Too much diversity (H high): fragmentation; no shared framework exists for collective action, mutual understanding, or democratic deliberation.

The optimal entropy H^* satisfies:

$$H^* = \arg\max_H \; W(H) = \underbrace{\alpha \cdot D(H)}_{\text{diversity benefit}} - \underbrace{\beta \cdot F(H)}_{\text{fragmentation cost}}$$

where $D(H)$ increases with entropy (more diverse perspectives improves collective decision-making) and $F(H)$ increases with entropy (more fragmentation makes collective action harder). The optimum balances these: enough diversity to prevent capture, enough coherence to sustain cooperation.

This tradeoff is not merely theoretical. The current moment in many democracies may involve *too much* entropy (post-truth fragmentation) rather

than too little (common-sense capture by a single narrative). Epistemic democracy requires not just challenging dominant narratives but building *shared epistemic infrastructure* (common reference points, trusted institutions, agreed-upon methods of evaluation) that can sustain democratic deliberation without collapsing into either capture or chaos.

33.6 Limitations and Risks

33.6.1 Who guards the guardians?

Any institutional design for epistemic democracy creates new concentrations of power: who selects the facilitators for citizens' assemblies? Who designs the transparency requirements? Who governs the public media? These questions do not have perfect answers (they are variants of the ancient problem of *quis custodiet ipsos custodes?*), but they can be mitigated through:

- layered accountability (each institution overseen by a different body),
- term limits and rotation for governance positions,
- sunset clauses requiring periodic renewal and review,
- constitutional protections for editorial independence.

33.6.2 The risk of epistemic paternalism

Principle 33.10 (Anti-Paternalism Constraint)**.** Epistemic democracy aims to democratize belief *production*, not to determine belief *content*. The goal is an information environment in which citizens can form beliefs through free and informed deliberation, not an environment in which the "correct" beliefs are pre-selected by experts. Any institutional design that empowers a specific group to determine what the public "should" believe has replaced plutocratic doxonomic power with technocratic doxonomic power, which is not an improvement.

The line between providing information and shaping belief is not always clear. But the principle provides a guide: epistemic-democratic institutions should increase the diversity and quality of available information, not select the conclusions that citizens should draw from it.

33.7 Notes and References

On epistemic democracy, see Dewey (1927), Habermas (1962), and Landemore (2012). Public media is analyzed in McChesney (1999) and Cushion (2012). Mechanism design draws on Arrow (1963) and Myerson (1981). On participatory governance, see Ostrom (1990) and Wright (2010).

For democratic theory and agonistic pluralism, see Mouffe (2005). Deliberative mini-publics are surveyed in Fishkin (2009) and Landemore (2020).

On epistemic public goods, see Anderson (2006) and Kitcher (2011). Media ownership and epistemic concentration are analyzed in Baker (2007).

For the diversity-coordination tradeoff, see Page (2007) on the diversity prediction theorem and Sunstein (2002) on the risks of group polarization. On epistemic paternalism, see Goldman (1999).

33.8 Exercises

Exercise 33.1. Design a transparency regime for think-tank funding.

1. What information should be disclosed (donor identity, amounts, strings attached)?
2. At what threshold should disclosure be required?
3. How would you enforce compliance?
4. Estimate the effect on EHI if full transparency were achieved.
5. What resistance to transparency would you expect, and from whom?

Exercise 33.2. Compare the epistemic concentration (EHI) of a country with strong public media (e.g., Germany) vs. one with primarily commercial media (e.g., the US).

1. Estimate EHI for each using available data on media ownership and think-tank funding.
2. Compare levels of political knowledge, misinformation susceptibility, and polarization.
3. Does the data support the hypothesis that public media reduces epistemic concentration?
4. What confounding factors might explain the differences?

Exercise 33.3. Formalize the diversity-coordination tradeoff (Model 33.9).

1. Specify functional forms for $D(H)$ and $F(H)$.
2. Compute H^* analytically.
3. Is the current entropy in your country above or below H^*?
4. What institutional changes would move entropy toward the optimum?

Exercise 33.4. Design a deliberative mini-public (Definition 33.7) to address a doxonomically contested question (e.g., "Is economic inequality too high?" or "Should social media algorithms be regulated?").

1. How would you select participants?
2. What information would you provide, and how would you ensure balance?
3. How would you structure the deliberation?
4. How would you connect the mini-public's recommendations to actual policy?

Exercise 33.5. Apply the anti-paternalism constraint (Principle 33.10) to a specific epistemic-democratic proposal.

1. Choose a proposal (e.g., public media reform, curriculum revision, platform regulation).

2. Identify the point at which the proposal risks crossing from "democratizing information" to "determining beliefs."
3. Design institutional safeguards to stay on the right side of the line.

Exercise 33.6 (Computational). Simulate the optimal entropy model:

1. Define $D(H) = a\sqrt{H}$ (diversity benefit, concave) and $F(H) = bH^2$ (fragmentation cost, convex).
2. Compute H^* analytically for $a = 2$, $b = 0.5$.
3. Simulate a society with 20 narrative frames and varying institutional arrangements (monopoly, duopoly, public media + commercial, fully fragmented).
4. Measure H under each arrangement. Which comes closest to H^*?
5. What institutional design parameters (number of public media outlets, funding levels, transparency requirements) most effectively move H toward H^*?

CHAPTER 34

Designing Better Belief Ecologies

> Another world is not only possible, she is on her way. On a quiet day, I can hear her breathing.
>
> Arundhati Roy

Doxonomics is not only diagnostic. It can also be constructive: guiding the design of institutional environments that produce more accurate, diverse, and socially beneficial belief ecologies. The preceding chapters documented how existing belief ecologies are shaped by concentrated funding, institutional inertia, and self-fulfilling mechanisms. This chapter asks: what would a *well-designed* belief ecology look like, and how would we get there from where we are?

The question is not utopian. It draws on the same engineering logic that doxonomics applies diagnostically: if we understand the mechanisms that produce belief, we can design institutions that produce better belief: belief that is more responsive to evidence, more pluralistic, more transparent about its origins, and more equitable in its distribution.

34.1 Design Principles

Principle 34.1 (Belief Ecology Design)**.** A well-designed belief ecology satisfies five criteria:

1. **Diversity**: narrative entropy $H > H_{\min}$ (no single frame dominates any major public question).

2. **Accuracy**: beliefs track evidence (mean error $\mathbb{E}[|B_i - p_i|]$ is minimized, where p_i is the best available evidence).

3. **Transparency**: institutions maintain credibility through openness about funding, methods, and interests, not through prestige, repetition, or funding advantages.

4. **Responsiveness**: new evidence changes beliefs within a reasonable time horizon (the system is not locked in by institutional inertia).

5. **Equity**: no group's beliefs are systematically distorted by asymmetric exposure; the epistemic Herfindahl index EHI is below the capture threshold.

34.1.1 Tensions between principles

These five principles are not always compatible. Diversity can conflict with accuracy (if some of the diverse narratives are false). Responsiveness can conflict with stability (if beliefs shift too easily, social coordination is undermined). Equity can conflict with efficiency (equalizing narrative access may be costly).

Proposition 34.2 (Design Tradeoffs)**.** *The five design principles define a multi-objective optimization problem. No belief ecology can simultaneously maximize all five. The practical question is: which tradeoffs are acceptable? A society must choose its position on the diversity-accuracy frontier, the responsiveness-stability frontier, and the equity-efficiency frontier. These choices are themselves political: they are the meta-level of doxonomic governance.*

34.2 Cooperative Anthropologies

34.2.1 The evidence base

If the selfish-human-nature regime is a doxonomic product (Chapter 21), what would a cooperative anthropological regime look like, and what institutional infrastructure would support it?

The evidence from Bowles and Gintis (2011), Ostrom (1990), and Nowak (2006) supports an anthropology in which humans are *conditional cooperators*: capable of both selfishness and cooperation, with the balance depending heavily on institutional context. A belief ecology designed around this evidence would:

- teach cooperation as a capacity (not naivete) and self-interest as a tendency (not a law),
- design institutions that reward reciprocity rather than defection,
- provide narratives of successful cooperation alongside narratives of competition,
- create incentive structures that assume reciprocity as the default rather than selfishness.

34.2.2 Existing models

Several existing institutional arrangements approximate a cooperative anthropological regime:

Mondragon cooperatives. The Mondragon Corporation (Basque Country, Spain) is a federation of worker cooperatives employing over 80,000 people with annual revenues exceeding €12 billion. Its institutional infrastructure (cooperative education (Mondragon University), internal banks (Caja Laboral), and democratic governance) constitutes a self-contained belief ecology in which cooperation is the operational default. The doxonomic output: workers in the Mondragon system report higher trust, stronger cooperative orientation, and lower belief in zero-sum competition than comparable workers in conventional firms.

Nordic social democracy. The Scandinavian model (universal welfare, strong unions, comprehensive public services, high social trust) constitutes a national-scale cooperative belief ecology. The institutional infrastructure (universal education, public media, social insurance) produces and sustains the belief that collective provision is both possible and desirable. Survey data confirm: Nordic populations score significantly lower on meritocratic individualism and significantly higher on social solidarity than Anglo-American populations.

Indigenous commons. Many indigenous communities maintain belief ecologies centered on reciprocity, stewardship, and collective responsibility, sustained through oral tradition, ceremony, communal land management, and intergenerational knowledge transmission. These ecologies are doxonomically efficient: they maintain cooperative beliefs with minimal institutional overhead, relying on community-embedded mechanisms rather than large-scale institutional investment.

34.3 Information Commons Design

34.3.1 Information as commons

Definition 34.3 (Information Commons)**.** An *information commons* is a shared pool of narrative resources (media, research, educational materials, data) governed by rules that prevent enclosure, monopolization, or degradation. Analogous to Ostrom's natural commons, an information commons requires governance institutions that prevent both overexploitation (misinformation flooding) and underinvestment (quality journalism defunding).

34.3.2 Design elements

Drawing on Ostrom (1990)'s design principles for successful commons governance:

Model 34.4 (Information Commons Governance)**.**

1. **Clearly defined boundaries**: distinguish the commons (public-interest information) from private information markets.
2. **Rules matched to local conditions**: information governance must be adapted to specific media ecosystems, not imposed uniformly.
3. **Collective-choice arrangements**: affected communities participate in governance decisions about the information commons (not just experts or owners).
4. **Monitoring**: independent bodies audit the quality, diversity, and funding sources of information in the commons.
5. **Graduated sanctions**: institutions that violate commons norms (e.g., undisclosed funding, fabricated research) face escalating consequences.
6. **Conflict resolution**: accessible, low-cost mechanisms for resolving disputes about information quality and narrative fairness.
7. **Recognized right to organize**: communities have the right to create their own information institutions without interference from dominant actors.
8. **Nested enterprises**: information governance operates at multiple scales (local, national, international), with coordination across levels.

34.4 A Policy Toolkit

34.4.1 Specific interventions

Intervention	Target principle	Estimated effect
Public media endowment	Diversity, accuracy	Reduces EHI by providing baseline quality information independent of commercial pressure
Think-tank transparency law	Transparency	Reduces effective credibility of opaquely funded institutions by ∼30–40% (Proposition 32.11)
Media literacy in K-12	Accuracy, equity	Reduces susceptibility α by ∼20–30% per cohort
Platform algorithm auditing	Diversity, responsiveness	Prevents algorithmic entropy reduction (Proposition 29.4)
Cooperative economics in curricula	Accuracy	Closes textbook-evidence gap for human nature beliefs
Citizens' assemblies on major policy	Diversity, equity	Bypasses doxonomic concentration in policymaking

34.4.2 The optimal belief ecology model

Model 34.5 (Optimal Belief Ecology)**.** The social planner minimizes total doxonomic harm:

$$\min_{\mathcal{N},\mathcal{I}} \sum_i D_i(B_i) + \lambda \cdot (H_{\max} - H(\mathcal{N})) + \mu \cdot \mathrm{EHI}(\mathcal{I})$$

subject to budget constraints, where D_i is the social damage from distortion in belief domain i (e.g., the cost of climate inaction due to manufactured doubt), λ weights the penalty for low narrative diversity, and μ weights the penalty for epistemic concentration.

34.4.3 Transition pathways

The transition from current belief ecologies to better ones is itself a doxonomic challenge: the institutions that would need to change are the same institutions that produce the beliefs justifying the current arrangement.

Model 34.6 (Transition Pathway)**.** Three transition strategies:

1. **Institutional reform**: change existing institutions from within (curriculum reform, public media strengthening, transparency legislation). Slow but builds on existing infrastructure.
2. **Parallel construction**: build alternative institutions alongside existing ones (cooperative media, community education, independent research). Does not require defeating incumbents but requires sustained funding.
3. **Crisis exploitation**: prepare alternative narratives and institutions for deployment when crises open the Overton window (Chapter 30). Unpredictable timing but potentially rapid change.

In practice, all three strategies are needed simultaneously.

34.5 Real-World Experiments

Several real-world experiments approximate aspects of better belief ecologies:

Participatory budgeting (Porto Alegre, 1989–). Citizens directly allocate a portion of the municipal budget through deliberative assemblies. The doxonomic effect: participants develop more nuanced understanding of fiscal tradeoffs, reducing susceptibility to simplistic austerity narratives (Chapter 26).

Finland's media literacy curriculum. Finland integrates media literacy across all subjects from primary school onward. The result: Finnish students consistently score highest in the OECD on distinguishing fact from opinion. The doxonomic effect: reduced susceptibility to misinformation and doxonomic manipulation.

Taiwan's digital democracy. The g0v and vTaiwan platforms use open-source tools for participatory policymaking, with algorithms designed to find consensus rather than amplify division. The doxonomic effect: a digital information environment designed for deliberation rather than engagement.

Community media in Latin America. Bolivia, Venezuela, and other Latin American countries have legally recognized community media: radio, television, and digital platforms operated by local communities with public funding. The doxonomic effect: reduced EHI at the local level; narrative production by communities rather than only by commercial or state actors.

34.6 Limits of Design

34.6.1 The power problem

Better belief ecologies cannot be designed in a vacuum. The actors who benefit from the current ecology (concentrated media owners, well-funded think tanks,

corporations that profit from consumerism or austerity) will resist reforms that reduce their doxonomic power. The design question is inseparable from the political question: who has the power to implement the design?

34.6.2 The complexity problem

Belief ecologies are complex adaptive systems. Interventions produce unintended consequences: a transparency law may drive funding underground (dark money); a media literacy program may produce cynicism rather than critical engagement; a public media expansion may crowd out independent journalism. Design must be iterative, monitored, and revisable, not imposed once and assumed to work.

34.6.3 The pluralism problem

Who decides what "better" means? The design principles (Principle 34.1) embed normative commitments (diversity is good, accuracy is good, equity is good) that are widely shared but not universal. Some communities may prefer narrative unity (religious communities, traditional societies) over diversity. A commitment to epistemic democracy means respecting these preferences while insisting on the meta-level principle: the choice of belief ecology should itself be made democratically, not imposed by doxonomic power.

34.7 Notes and References

On real utopias and institutional imagination, see Wright (2010). Cooperative institutional design draws on Ostrom (1990) and Bollier (2014). The capabilities approach to social design is in Sen (1999) and Nussbaum (2011). On post-capitalist imagination, see Mason (2015) and Srnicek and Williams (2015).

On Mondragon, see Whyte and Whyte (1991). On Nordic social democracy and trust, see Rothstein (2005). Participatory budgeting is analyzed in Wampler (2007). Finland's media literacy program is documented in Hartikainen (2019). Taiwan's digital democracy experiments are described in Tang (2019).

Community media in Latin America is analyzed in Ramos (2020). On information commons, see Hess and Ostrom (2007). For complex systems approaches to institutional design, see Meadows (2008).

34.8 Exercises

Exercise 34.1. Design a belief ecology for a school system.

1. Specify the anthropological regime taught (selfish, cooperative, conditional cooperator, or other).
2. Set target levels for each of the five design principles.

3. Identify the institutional infrastructure needed (curricula, teacher training, assessment, media literacy).
4. How would you measure whether the ecology is working (what outcomes would you track)?
5. Estimate the cost of implementing your design in a school district of 50,000 students.

Exercise 34.2. Using Model 34.5, argue that the socially optimal belief about human nature is "conditional cooperator" rather than either "pure selfish" or "pure altruist."

1. Define $D_i(B_i)$ for the human-nature domain. What is the social damage from believing humans are purely selfish? From believing they are purely altruistic?
2. Show that the minimum-damage belief lies between the extremes.
3. How does the optimal belief depend on the institutional environment?

Exercise 34.3. Propose three policy interventions that would increase narrative entropy in a media system currently dominated by five corporations. For each, estimate:

1. the expected effect on H and EHI,
2. the political feasibility (who would support and oppose the intervention?),
3. the implementation cost,
4. the risk of unintended consequences.

Exercise 34.4. Apply the information commons governance model (Model 34.4) to the digital media ecosystem.

1. Which of Ostrom's eight principles are currently violated?
2. Design a governance structure for a "digital information commons" that satisfies all eight.
3. What existing institutions could serve as building blocks?
4. What new institutions would need to be created?

Exercise 34.5. Evaluate one of the real-world experiments (Section 34.5) using the five design principles.

1. Which principles does the experiment advance?
2. Which does it neglect?
3. What evidence exists for its effectiveness?
4. How would you scale the experiment to a larger population?

Exercise 34.6 (Computational). Simulate a belief ecology with and without design interventions:

1. Create a baseline ecology: 5 narrative producers with budgets drawn from a Pareto distribution, 1,000 agents, SIR-type belief dynamics.
2. Measure H, EHI, and mean belief accuracy.
3. Introduce intervention A: a public media institution with 10% of total budget but high credibility. Measure the change in H and EHI.

4. Introduce intervention B: media literacy training that reduces α by 25% for 30% of agents. Measure the change.
5. Introduce both A and B. Are the effects additive or synergistic?
6. Which intervention produces more belief-ecology improvement per dollar?

CHAPTER 35

Ethics of Doxonomics

> The question is not whether we will be extremists, but what kind of extremists we will be.
>
> Martin Luther King Jr.

A science that studies how beliefs are manufactured must confront an uncomfortable question: does studying belief engineering risk becoming belief engineering? Doxonomics provides tools for understanding how power shapes belief, but those same tools could be used to shape belief more effectively. This chapter addresses the ethical tensions inherent in doxonomics: the line between description and intervention, the danger of technocratic belief management, the dual-use problem, research ethics, the responsibility of knowledge, and the paradox of a discipline that must apply its own critical lens to itself.

35.1 Description vs. Intervention

35.1.1 The observer effect

Doxonomics is primarily descriptive: it maps how beliefs are produced, not how they should be produced. But description is never fully neutral. Revealing that a belief is heavily subsidized changes its status. A doxonomic audit is itself a doxonomic intervention.

Proposition 35.1 (Doxonomic Observer Effect)**.** *Publishing a doxonomic analysis of belief p changes the epistemic status of p by:*

1. *revealing the funding structure (reducing credibility through the disclosure effect, Proposition 32.11),*
2. *making the production chain visible (enabling inoculation),*
3. *providing ammunition for counter-narratives,*

4. potentially provoking defensive responses from the institutions analyzed. The doxonomic analysis is therefore never purely descriptive. It is a participant in the system it studies.

This does not invalidate doxonomic research (all social science affects its object of study to some degree), but it requires honest acknowledgment. The researcher who reveals that "belief p is funded by industry X" is not merely reporting a fact; they are performing a doxonomic intervention whose effects can be predicted using the same models they employ.

35.1.2 The transparency principle

Principle 35.2 (Transparency Principle)**.** Doxonomic research should be transparent about its own funding, institutional position, and potential biases. The field that studies how credibility is manufactured must maintain its own credibility through radical openness:

1. full disclosure of research funding sources,
2. explicit statement of the researcher's institutional position and potential conflicts,
3. acknowledgment of the researcher's own normative commitments (no doxonomic analysis is value-free),
4. open data, open methods, and pre-registration where possible.

35.2 The Danger of Technocratic Belief Management

35.2.1 The temptation

Definition 35.3 (Doxonomic Technocracy)**.** A *doxonomic technocracy* is a regime in which experts use doxonomic tools to manage public belief "for the public good": deciding which beliefs are beneficial, designing institutions to promote them, and measuring success by the degree to which the population adopts the "correct" beliefs. This is the dark twin of epistemic democracy: belief management by experts who decide what people should think.

Doxonomics must resist this temptation. The purpose of the field is to make belief production *visible and accountable*, not to replace one set of belief engineers with another. The distinction matters: a doctor who diagnoses a disease is not the same as a doctor who infects patients; a doxonomist who maps belief production is not the same as a doxonomist who manages it.

35.2.2 Historical warnings

The history of "scientific" belief management is cautionary:

- **Soviet propaganda theory**: the explicit application of social science to belief management produced a system of ideological control that was both intellectually sophisticated and morally catastrophic.
- **Bernays and public relations**: Freud's nephew used psychological insights to engineer consent for commercial and political purposes, precisely the kind of "applied doxonomics" that the field should not become (Bernays 1928).
- **Behavioral nudging**: the "nudge" movement uses behavioral science to shape choices "for people's own good," a mild form of technocratic belief management that raises genuine questions about autonomy and paternalism.
- **Platform optimization**: social media algorithms are currently the most powerful applied-doxonomic technology, and they are operated by private corporations with no democratic accountability.

35.2.3 The line

Principle 35.4 (Anti-Technocracy Principle)**.** Doxonomics should:

- reveal the mechanisms of belief production (diagnostic use),
- provide tools for citizens and democratic institutions to evaluate belief claims (empowerment use),
- support the design of more transparent and accountable belief-producing institutions (structural use).

Doxonomics should *not*:

- determine which beliefs the public should hold (content control),
- design systems to maximize adoption of specific beliefs, even "true" ones (engineering use),
- serve as a consulting service for actors seeking to improve their belief-production efficiency (instrumentalization).

The line is between *making the system visible* and *operating the system*.

35.3 The Dual-Use Problem

35.3.1 Knowledge as weapon

Definition 35.5 (Doxonomic Dual Use)**.** *Doxonomic dual use* arises when the same knowledge that enables democratic accountability also enables more effective manipulation. Understanding how beliefs are produced helps citizens resist manipulation, but it also helps manipulators refine their techniques.

This is not a hypothetical concern. Every technique analyzed in this book (framing analysis, inoculation, credibility management, crisis narrative deployment, Overton window shifting) can be used by democratic movements seeking transparency *or* by authoritarian regimes seeking more effective propaganda.

35.3.2 The authoritarian adoption scenario

Example 35.6. An authoritarian regime that reads this textbook could use it to:

- optimize its propaganda budget allocation using the IROI framework,
- design more effective credibility-laundering operations using the academic credibility model,
- exploit crisis windows more efficiently using the shock-doctrine framework,
- inoculate its population against democratic counter-narratives using the inoculation model,
- monitor belief dynamics using the formal models to detect and suppress dissent before it reaches the cascade threshold.

35.3.3 Can the dual-use problem be solved?

The dual-use problem cannot be eliminated: it is inherent in any knowledge about social systems. But several principles can mitigate it:

1. **Publication bias toward defense**: prioritize publishing defensive techniques (inoculation, media literacy, transparency) over offensive ones (optimal manipulation strategies).
2. **Empowerment over expertise**: design doxonomic tools for citizen use, not expert use: tools that are accessible, open-source, and designed to democratize analysis rather than concentrate it.
3. **Institutional safeguards**: professional norms, ethics review, and institutional oversight that discourage the instrumentalization of doxonomic knowledge.
4. **Radical openness**: make all doxonomic knowledge public. Secrecy benefits the powerful (who can afford private research); openness benefits the public (who gain analytical tools they would otherwise lack).

35.4 Research Ethics

35.4.1 Specific ethical challenges

Doxonomic research raises ethical issues that go beyond standard social-science IRB protocols:

1. **Experiments that manipulate beliefs.** As discussed in Chapter 19, doxonomic experiments that successfully shift beliefs may have lasting effects on participants. The ethical standard must be higher than "informed consent": participants may not fully understand the potential for lasting belief change.

2. **Revealing funding sources.** Doxonomic analysis may reveal that a researcher, journalist, or institution is funded by sources they prefer to keep hidden. Disclosure can damage careers and reputations. The public interest in transparency must be weighed against the potential harm to individuals.

3. **Institutional analysis as political act.** Documenting the doxonomic production chain of a specific think tank, media outlet, or educational institution will be perceived, correctly, as a political challenge to that institution. Researchers must distinguish between legitimate analysis and political attack, and must apply the symmetry obligation (Principle 20.19): analyzing institutions you disagree with while exempting those you support is not doxonomic research; it is doxonomic warfare.

4. **Vulnerable populations.** Doxonomic analysis may reveal that specific populations are disproportionately targeted by belief-production campaigns (low-income communities by payday-lending advertising, racial minorities by voter-suppression messaging, children by junk-food marketing). Reporting this analysis serves the public interest but may also stigmatize the affected populations.

35.4.2 A proposed ethics code

Model 35.7 (Doxonomic Research Ethics Code)**.**

1. **Transparency**: disclose all funding, affiliations, and potential conflicts.
2. **Symmetry**: apply analytical methods equally to institutions you support and oppose.
3. **Proportionality**: match the strength of claims to the strength of evidence (the graduated language of Chapter 20).
4. **Minimization of harm**: consider the potential consequences of publication for individuals, communities, and institutions.
5. **Empowerment**: design research to empower citizens, not to serve powerful actors.
6. **Reflexivity**: acknowledge and analyze the doxonomic conditions of your own research.
7. **Open access**: make research freely available wherever possible.

35.5 The Responsibility of Knowledge

35.5.1 What follows from knowing?

If you know that a widely held belief was manufactured through institutional investment rather than evidence, what is your obligation?

1. **The minimalist position**: your obligation is to report the finding accurately. What the public does with the information is their responsibility.

2. **The activist position**: if you know that manufactured beliefs cause harm (austerity causes suffering, selfishness narratives reduce cooperation, climate denial delays action), you have an obligation to work toward counter-doxonomic change.

3. **The structural position**: individual obligation is less important than institutional design. The goal is not to convince individuals but to build institutions that produce better belief ecologies (Chapter 34).

Doxonomics as a field does not resolve this debate. But it does clarify the stakes: beliefs are not just private mental states. They are socially produced, materially consequential, and subject to deliberate manipulation. The pretense that belief formation is a purely individual matter, exempt from ethical analysis, is itself a doxonomic product.

35.6 The Doxonomic Paradox

Remark 35.8 (The Doxonomic Paradox). Doxonomics studies how power shapes belief, but doxonomics itself is shaped by the power structures within which it operates. Its funding, institutional home, and audience determine what questions it can ask and what answers it can publish. No doxonomic analysis is exempt from doxonomic analysis.

The paradox is not a logical contradiction; it is a practical challenge. It does not invalidate doxonomics any more than the sociology of science invalidates science. But it demands *reflexivity*: the field must apply its own tools to itself, disclosing its funding, biases, and institutional constraints.

Example 35.9. A doxonomic self-analysis of this textbook:

- *Funding*: produced by the Piatra Institute. What are the Institute's funding sources, and do they create potential biases?
- *Institutional position*: the textbook is positioned as founding a new field, which creates an incentive to overstate the field's importance and understate its limitations.
- *Normative commitments*: the book is critical of concentrated economic power, sympathetic to democratic governance, and skeptical of market fundamentalism. These commitments shape which case studies are chosen, which examples are emphasized, and which counter-arguments are strongest.
- *Audience*: the intended audience is academics and students interested in political economy, which selects for readers already sympathetic to the book's premises.

This self-analysis does not neutralize the biases; it makes them visible, allowing readers to calibrate their reading accordingly.

35.7 Notes and References

On reflexivity in social science, see Bourdieu (1984) and Gouldner (1970). The ethics of social research are discussed in Salganik (2018) and Israel and Hay (2006). On the dangers of technocratic governance, see Scott (1998) and Habermas (1962). The dual-use problem in research connects to Oreskes and Conway (2010) and Selgelid (2009).

On propaganda and belief engineering, see Bernays (1928) and Ellul (1965). The nudge debate is in Thaler and Sunstein (2008) and Rebonato (2012). On the responsibility of intellectuals, see Chomsky (1967) and Said (1994). For professional ethics in research, see the Belmont Report (1979) and its successors.

35.8 Exercises

Exercise 35.1. Apply doxonomic analysis to this textbook (expanding on Example 35.9).

1. Research the Piatra Institute's funding and institutional position.
2. Identify the book's normative commitments and assess whether they bias the analysis.
3. Which case studies are chosen, and which plausible case studies are omitted?
4. Does the book apply the symmetry obligation to itself?
5. Write a one-page "doxonomic audit" of the textbook.

Exercise 35.2. Design an ethics protocol for doxonomic research that balances transparency with the protection of sources and subjects.

1. When should funding sources be revealed, and when should whistleblower protection apply?
2. How should institutional analysis be distinguished from political attack?
3. What IRB modifications are needed for experiments that manipulate beliefs?
4. How should the dual-use problem be addressed in publication decisions?

Exercise 35.3. Argue for or against the following proposition: "Doxonomic tools should be classified as dual-use technology, subject to restrictions on their application by state propaganda agencies."

1. What are the strongest arguments for restriction?
2. What are the strongest arguments against (including the risk that restriction itself becomes a tool of censorship)?

3. Propose a specific governance framework, if you favor restriction, or explain why unrestricted publication is preferable.

Exercise 35.4. Consider the three positions on the responsibility of knowledge (Section 35.5).

1. Which position do you find most compelling, and why?
2. What are the practical implications of each position for how a doxonomic researcher conducts their career?
3. Can the three positions be reconciled, or are they genuinely in tension?

Exercise 35.5. Identify a real-world case in which doxonomic knowledge was used for manipulation rather than empowerment (e.g., Cambridge Analytica, state propaganda, corporate astroturfing).

1. What doxonomic techniques were employed?
2. Could the dual-use problem have been mitigated through any of the strategies in Section 35.3?
3. What institutional safeguards failed, and what safeguards might have prevented the misuse?

CHAPTER 36

Toward a Science of Social Self-Understanding

> The owl of Minerva spreads its wings only with the falling of the dusk.
>
> G. W. F. Hegel, *Philosophy of Right*

This final chapter surveys what doxonomics can and cannot explain, develops the open problems whose resolution will define the field's future, sketches the research programs that will address them, locates doxonomics within the landscape of neighboring disciplines, and closes with a reflection on what it means to study the social production of belief, knowing that one's own beliefs are, inevitably, socially produced.

36.1 What Doxonomics Can Explain

The framework developed across the preceding 34 chapters provides tools for answering a specific class of questions:

1. **How specific beliefs achieved dominance through institutional investment.** The selfishness regime (Chapter 21), meritocracy (Chapter 22), consumerism (Chapter 23), and austerity (Chapter 26) were all analyzed as products of identifiable institutional investment operating through traceable production chains.

2. **The financial structure of narrative production.** Doxonomic accounting (Chapter 14) provides tools for mapping the flow of money through narrative-producing institutions and estimating the return on doxonomic investment.

3. **Why beliefs persist despite contrary evidence.** Funded repetition (the $\alpha\phi$ term in the belief dynamics models), institutional credibility, and self-fulfilling mechanisms all explain how beliefs can survive, and even strengthen, in the face of disconfirming evidence.

4. **How beliefs become self-fulfilling through behavioral feedback.** The selfishness regime's self-fulfilling prophecy (Theorem 21.5), the segregation-hierarchy loop (Proposition 25.3), and the meritocracy-inequality spiral (Model 22.8) all demonstrate how beliefs can generate the conditions that appear to confirm them.

5. **The conditions under which belief regimes fracture.** The bifurcation model (Chapter 31), the credibility cascade mechanism, and the crisis dynamics (Chapter 30) provide a formal framework for understanding when and how dominant beliefs collapse.

6. **The welfare costs of doxonomic externalities.** The doxonomic market model (Chapter 10) and the legitimation cost analysis (Chapter 24) provide tools for estimating the social costs of manufactured belief.

36.2 What Doxonomics Cannot Explain

Equally important are the questions doxonomics does *not* answer:

1. **Why specific individuals resist dominant beliefs.** Doxonomics is a social-level theory. It predicts population-level belief distributions, not individual belief formation. Why some people see through doxonomic production while most do not (the psychology of dissent) is a question for cognitive science, personality psychology, and biography, not for doxonomics.

2. **The full content of any belief.** Doxonomics studies the *production* of belief, not its *content* or *truth value*. Showing that a belief is funded does not show that it is false (the genetic fallacy). Showing that a belief is unfunded does not show that it is true.

3. **Whether a belief should be held.** Doxonomics is descriptive and analytical, not normative. It can show that a belief was produced through institutional investment rather than evidence, but the normative conclusion ("therefore the belief should be questioned") requires an additional premise about the epistemic authority of evidence over institutional repetition, a premise this book endorses but cannot derive from doxonomic analysis alone.

4. **The precise mechanisms of individual cognition.** Doxonomics treats agents as responsive to narrative exposure, social norms, and

institutional credibility, but it does not model the neural or cognitive mechanisms by which narratives are processed. It is social, not cognitive.

5. **Non-material sources of belief.** Religious revelation, aesthetic experience, love, grief, wonder: these shape belief in ways that are not reducible to institutional investment. Doxonomics covers the material-institutional dimension of belief production, which is enormous, but it is not the whole story.

36.3 Open Problems

The field's future will be shaped by the resolution of several foundational problems:

Conjecture 36.1 (Open Problems in Doxonomics)**.**

1. The Measurement Problem. *Can we construct a reliable, comparable, cross-national index of doxonomic concentration? The epistemic Herfindahl index (Definition 10.18) provides a theoretical framework, but practical measurement requires solving the problem of tracing funding through opaque channels, accounting for in-kind contributions, and weighting different narrative channels by their effectiveness.*

2. The Attribution Problem. *How much of a population's belief change is attributable to doxonomic investment vs. lived experience, peer influence, generational change, and autonomous reasoning? The causal methods of Chapter 16 provide tools, but the problem of separating these sources remains largely unsolved in practice.*

3. The Threshold Problem. *Is there a universal critical funding level above which common-sense capture becomes inevitable? Or does the threshold depend on contextual factors (existing beliefs, institutional landscape, cultural resilience) in ways that preclude generalization? If there is no universal threshold, can we at least identify the* factors *that determine the threshold in specific settings?*

4. The Decay Problem. *What determines the half-life of a doxonomic investment once funding is withdrawn? The generational decay model (Proposition 31.10) provides a starting point, but the actual decay rate depends on whether the belief has become self-fulfilling, whether it is embedded in institutional routines, and whether counter-narratives are available.*

5. The Self-Fulfillment Problem. *Can we formally separate beliefs that are true* because *they were funded (self-fulfilling prophecies, where the belief creates the conditions it describes) from beliefs that were funded* because *they were true (legitimate research communication)? This is the deepest methodological challenge in doxonomics: the funded belief and the true belief may look identical in the data.*

6. The Welfare Problem. *How should we compute the total social cost of a doxonomic externality? The Pigouvian framework (Chapter 10) provides a structure, but measuring the welfare cost of a belief distortion requires counterfactual reasoning about what policies would have been adopted under different beliefs, a profoundly difficult exercise.*

7. The Design Problem. *What is the optimal institutional architecture for minimizing doxonomic distortion while maintaining social coordination? Chapter 34 sketches design principles, but the multi-objective optimization problem (Proposition 34.2) does not have a known solution.*

8. The Reflexivity Problem. *Can doxonomics be applied to itself without infinite regress? The doxonomic paradox (Remark 35.8) suggests that the field must be reflexive, but reflexivity applied recursively ("the doxonomic analysis of the doxonomic analysis of the doxonomic analysis...") either converges (which would be interesting) or diverges (which would be troubling).*

9. The Computational Tractability Problem. *Can the sheaf-theoretic framework (Chapter 12) and the network models (Chapter 15) be made computationally tractable for real social systems with millions of agents and thousands of institutions? Current analytical models are illustrative; practical application requires scalable computation.*

10. The Historical Accounting Problem. *Can we retroactively estimate the total doxonomic investment in specific beliefs over centuries? The archival methods of Chapter 18 provide qualitative tools, but quantitative historical accounting faces severe data limitations for periods before the 20th century.*

36.4 Future Research Programs

36.4.1 Computational doxonomics

Large-scale simulation of belief production chains using agent-based models calibrated to real funding data. The research agenda:

- build ABMs of specific narrative domains (climate, economics, health) with realistic institutional structure,
- calibrate model parameters against historical data (funding flows, survey time series, media content analysis),
- use calibrated models to predict the effects of policy interventions (transparency laws, public media expansion, media literacy programs),
- validate predictions against natural experiments and policy changes.

36.4.2 Comparative doxonomics

Cross-national comparison of narrative infrastructures and their effects on public belief. The research agenda:

- construct comparable measures of doxonomic concentration (EHI) across countries,
- compare the institutional infrastructure of belief production (think-tank density, media structure, educational systems) across political-economic regimes,
- test whether variation in institutional infrastructure predicts variation in public beliefs, controlling for economic conditions and cultural factors,
- identify "natural experiments" in institutional change (media deregulation, think-tank founding, curriculum reform) that allow causal estimation.

36.4.3 Historical doxonomics

Systematic reconstruction of the doxonomic history of major beliefs. The research agenda:

- construct longitudinal datasets of institutional funding for narrative production in specific domains,
- digitize and analyze archival materials using the computational methods of Chapter 17,
- develop methods for estimating doxonomic investment from indirect evidence (publication volumes, institutional founding dates, personnel flows),
- produce definitive doxonomic genealogies of the major belief regimes analyzed in Part IV.

36.4.4 Applied doxonomics

The development of practical tools for democratic institutions:

- doxonomic audit methodologies that can be applied by journalists, NGOs, and government agencies,
- real-time monitoring of narrative entropy and epistemic concentration,
- media literacy curricula grounded in doxonomic theory,
- policy evaluation frameworks that include doxonomic effects.

36.5 Doxonomics and Its Neighbors

Doxonomics draws on and contributes to several established fields:

Field	What doxonomics takes from it	What doxonomics adds
Political economy	Institutional analysis, power structures	Formal models of belief production
Sociology of knowledge	Social construction of belief	Quantitative measurement, funding-tracing
Media studies	Content analysis, framing theory	Institutional economics of narrative production
Behavioral economics	Cognitive biases, bounded rationality	Institutional sources of bias (not just cognitive)
Science and technology studies	Social shaping of knowledge	Application to all belief domains, not just science
Critical theory	Ideology critique, hegemony	Mathematical formalization, empirical testing

Doxonomics does not replace any of these fields. It provides a *connective framework* (a common language of formal models, measurement tools, and causal methods) that allows insights from each field to be integrated into a unified analysis of how power shapes belief.

36.6 What Would Success Look Like?

If doxonomics succeeds as a field, what changes?

1. **Routine doxonomic auditing**: major policy debates would routinely include an analysis of who funds the competing narratives and through what institutional channels, just as financial auditing is now routine for corporate governance.

2. **Doxonomic literacy**: citizens would be trained to ask "who funded this claim, and why?" just as they are trained to check sources in academic writing.

3. **Institutional transparency**: funding disclosure for narrative-producing institutions would be as standard as financial disclosure for corporations.

4. **Better belief ecologies**: policy interventions informed by doxonomic analysis (public media, media literacy, epistemic pluralism requirements) would produce information environments that are more diverse, more evidence-responsive, and more equitable.

5. **Self-awareness**: societies would have a vocabulary for discussing the industrial production of common sense, just as they now have vocabularies

for discussing economic production, public health, and environmental quality.

None of these outcomes requires that doxonomics achieve the precision of physics or the predictive power of epidemiology. It requires only that the field provide *useful tools*: tools that make visible what was previously invisible, that measure what was previously unmeasured, and that enable choices where there were previously only defaults.

36.7 Final Reflection

A society that can measure its economic output, its carbon emissions, and its disease burden, but cannot measure the industrial production of its own common sense, has a blind spot at the center of its self-understanding.

This book has attempted to illuminate that blind spot, to develop the concepts, models, methods, and applications needed to study how material power shapes public belief. The attempt is preliminary. The models are stylized. The empirical base is thin in many areas. The field does not yet exist as an institutionalized discipline with departments, journals, and professional norms.

But the phenomenon it studies is real. The funding flows are traceable. The institutional production chains are visible. The beliefs they produce have measurable consequences for inequality, democracy, well-being, and collective action. And the alternative (pretending that common sense is natural, that ideas succeed on their merits, that the marketplace of ideas is free and fair) is not intellectual modesty. It is a refusal to look at the evidence.

Doxonomics does not promise to eliminate ideology. It does not promise to free humanity from the influence of power on belief. It promises something more modest and more useful: the tools to *see* how beliefs are produced, to *measure* what they cost, and to *ask* whether the world might believe otherwise.

That is the beginning of doxonomic literacy. And doxonomic literacy, like all literacy, is the precondition for freedom: not freedom from all influence, which is impossible, but freedom to *know* what influences you, which is the beginning of choosing for yourself.

36.8 Notes and References

On the project of social self-understanding, see Dewey (1927) and Habermas (1962). The Hegelian epigraph and its implications for a science that arrives "at dusk" (after the phenomena it studies are already in place) connect to Hegel's *Philosophy of Right* (1820) and to Marx's inversion of Hegel (the point is to change the world, not merely to understand it).

On real utopias and institutional imagination, see Wright (2010). On the relationship between social science and democracy, see Putnam (2000) and Dewey (1927). For the epistemic responsibilities of researchers, see Kitcher (2001) and Douglas (2009).

The open problems listed here are original to this text, though each connects to established research programs in the fields enumerated in Section 36.5.

36.9 Exercises

Exercise 36.1. Choose one open problem from Conjecture 36.1. Write a two-page research proposal outlining:

1. the specific question you would address,
2. the data sources and methods you would use,
3. the expected results and how they would advance the field,
4. the limitations of your proposed approach,
5. how you would evaluate whether the problem has been "solved" or merely "advanced."

Exercise 36.2. Design a one-semester "Doxonomic Literacy" course for undergraduates.

1. Specify 14 weekly topics (drawing on the structure of this book).
2. For each week, identify the key concept, the reading, and a practical exercise.
3. Design the assessment: what should students be able to *do* at the end of the course?
4. How would you evaluate whether the course has actually improved students' doxonomic literacy (as opposed to merely teaching them the vocabulary)?

Exercise 36.3. Apply the full doxonomic toolkit to a belief of your choice. Produce a mini case study (5–10 pages) covering:

1. doxonomic genealogy (when and how the belief was produced),
2. doxonomic account (who funds the belief and through what channels),
3. network analysis (the institutional structure of production),
4. causal analysis (evidence that the production causes belief change),
5. welfare estimation (what the belief costs society),
6. counter-doxonomic analysis (what counter-narratives exist and how well-funded they are).

Exercise 36.4. Write a critical review of this textbook from the perspective of a skeptic.

1. What are the strongest objections to the doxonomic framework?
2. Where does the book overclaim relative to its evidence?
3. What alternative explanations for the phenomena it documents are not adequately addressed?

4. What would need to be true for doxonomics to be fundamentally wrong?

Exercise 36.5. Imagine doxonomics 20 years from now.

1. Which open problems (Conjecture 36.1) are most likely to have been resolved?
2. What new problems will have emerged?
3. What institutional infrastructure will the field need (journals, departments, professional associations)?
4. What is the greatest risk the field faces (co-optation? irrelevance? technocratic capture?)?

Glossary of Doxonomic Terms

Anthropological regime
: A dominant practical model of human nature specifying motivational theory, social ontology, and capacity claims. See Definition 2.12.

Asymptotic capture
: The process by which sufficiently asymmetric evidence exposure drives beliefs to certainty regardless of prior. See Conjecture 5.11.

Belief production chain
: The composition of operators from funding through institutional processing, narrative output, circulation, internalization, behavioral consequence, to reproduction. See Definition 5.1.

Belief stock
: The fraction of a population holding a given belief at a given time. See Definition 11.1.

Common sense
: A proposition held with high credence and low variance across a population. See Definition 2.5.

Common-sense capture
: The phase transition by which a funded narrative becomes invisible as a claim, experienced as a feature of reality. See Definition 8.1.

Conversion problem
: The foundational problem of doxonomics: how resources are converted into durable public belief.

Counter-doxonomics
: The study and practice of resisting, disrupting, or replacing dominant doxonomic regimes. See Chapter 32.

Credibility collapse
: Rapid decline in institutional credibility due to scandal, failure, or exposure. See Definition 31.6.

Doxa
: (Greek) The unquestioned taken-for-granted; beliefs so deeply embedded they are not perceived as beliefs. See Definition 2.6.

Doxametry
: The quantitative measurement branch of doxonomics. See Chapter 13.

Doxonomic equilibrium
: A fixed point of the belief production chain where beliefs reproduce the conditions of their own production. See Definition 5.15.

Doxonomic externality
: A social cost generated when a subsidized belief reshapes behavior in harmful ways. See Definition 10.11.

Doxonomic game
: An experimental economic game administered after exposure to a doxonomic treatment. See Definition 19.1.

Doxonomic network
: A weighted directed graph of funders, institutions, media, and audiences connected by influence or resource flows. See Definition 15.1.

Doxonomic power
: The capacity to shape the conditions under which people form beliefs, including the power to set priors, agendas, and epistemic rules. See Definition 9.1.

Doxonomic system
: A structured ensemble of agents, institutions, narrative spaces, belief spaces, and operators for production and internalization. See Definition 1.1.

Doxonomics
: The science of how material power shapes public belief. From Greek *doxa* (opinion, belief) and *-nomics* (systematic study).

Epistemic broker
: A node with high betweenness centrality in a doxonomic network, bridging otherwise disconnected narrative clusters. See Definition 15.8.

Epistemic capital
Resources convertible to credibility, attention, or authority in belief formation. See Definition 6.1.

Epistemic democracy
A social arrangement in which belief production is not dominated by a narrow set of funders or institutions. See Definition 33.1.

Epistemic fragmentation
A condition in which populations inhabit incommensurable belief worlds with no shared epistemic framework. See Definition 12.14.

Epistemic Herfindahl Index (EHI)
A concentration score measuring market share in belief production. See Definition 10.18.

Epistemic rent
Excess doxonomic return earned from a monopoly position in legitimate knowledge production. See Definition 6.8.

Gluing obstruction
The failure of locally consistent belief systems to combine into a globally consistent whole, measured by sheaf cohomology. See Definition 12.5.

Ideological ROI (IROI)
The belief change achieved per unit of doxonomic investment. See Definition 10.5.

Lock-in A condition in which a belief is locally asymptotically stable with a large basin of attraction. See Definition 8.12.

Narrative entropy
The information-theoretic measure of diversity in the narrative space. See Definition 17.14.

Narrative flow The rate at which narrative content supporting a belief is produced and circulated. See Definition 11.1.

Narrative infrastructure
The durable network of institutions through which a society produces and reproduces its common sense. See Definition 7.1.

Narrative inoculation
: Preemptive exposure to a weakened dominant narrative plus refutation, reducing subsequent susceptibility. See Definition 32.6.

Narrative shield
: A set of beliefs that deflects attention from structural causes to individual explanations. See Definition 24.6.

Pluralistic ignorance
: A condition in which most individuals privately doubt a proposition but publicly affirm it. See Definition 2.8.

Prior-setting power
: The capacity to influence the initial belief distribution of a population, typically through education. See Definition 9.11.

Tipping point
: A discontinuous jump in equilibrium belief level caused by a small shift in threshold distribution. See Theorem 8.4.

Mathematical Notation and Basic Models

This appendix collects all mathematical notation and summarizes the core models developed in the text.

Complete Symbol Table

See the Notation chapter in the frontmatter for the full symbol table.

Core Models

Model 1: First-Order Belief Equation (Model 1.3)

$$B_i(t) = \sum_{k=1}^{m} F_k(t) \cdot C_k \cdot R_{k,i} \cdot P_k \cdot T_k - X_i(t)$$

Model 2: Stock-and-Flow Dynamics (Definition 11.1)

$$\frac{dB_i}{dt} = \alpha \cdot \phi_i(t) \cdot (1 - B_i(t)) - \delta \cdot B_i(t) + \beta \cdot B_i(t)(1 - B_i(t))$$

Model 3: SIR Belief Diffusion (Model 11.6)

$$\begin{aligned} \frac{dS}{dt} &= -\beta SI - \alpha\phi(t)S \\ \frac{dI}{dt} &= \beta SI + \alpha\phi(t)S - \gamma I \\ \frac{dR}{dt} &= \gamma I \end{aligned}$$

Doxonomic reproduction number: $R_0 = (\beta + \alpha\phi)/\gamma$.

Model 4: Doxonomic Input-Output (Model 5.20)

$$\boldsymbol{n} = (\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{d}$$

where $\boldsymbol{A}$ is the inter-institutional narrative flow matrix and $\boldsymbol{d}$ is the exogenous injection.

Model 5: Granovetter-Schelling Threshold (Model 8.3)

$$\mu^* = G(\mu^*)$$

where G is the CDF of individual adoption thresholds.

Key Equations

Equation	Reference
Optimal allocation	$C_k \cdot R_{k,i} \cdot c_k'(F_k) \cdot T_k = \lambda$ (Prop. 4.12)
Epistemic HI	$\text{EHI} = \sum_k s_k^2$ (Def. 10.18)
Welfare loss	$\int_{\mu^{**}}^{\mu^*} [D'(\mu) - c'(\mu)]\, d\mu$ (Thm. 10.14)
Polarization	$\pi_A^{(T)} \to 1$, $\pi_B^{(T)} \to 0$ under asymmetric exposure (Thm. 11.13)
Legitimation	$L(I, \phi_L) = \phi_L/(\phi_L + \kappa(I - I_0)^+)$ (Def. 24.1)
Fixed point	$\boldsymbol{F}^* = \mathcal{B}(\boldsymbol{F}^*)$ (Def. 5.15)

Guide to Data Sources

This appendix lists major data sources for doxonomic research, organized by type.

Source-quality classification. Each source is tagged with an epistemic status to help researchers assess reliability:

primary Original data collected through systematic procedures (government filings, surveys, sensor data).

secondary Compiled or curated from primary sources (databases, indices, meta-analyses).

commercial Proprietary data sold by private firms; methodology may not be fully transparent.

self-report Data reported by organizations about themselves (annual reports, transparency reports).

advocacy Data compiled by organizations with an explicit political or ideological mission; useful but requires independent verification.

Researchers should triangulate across source types and never rely solely on advocacy or self-report data for causal claims.

Advertising Data

WARC Global Ad Trends Global and regional advertising expenditure data. COMMERCIAL

eMarketer/Insider Intelligence Digital advertising forecasts and spending data. COMMERCIAL

Ad$pender (Kantar) Detailed U.S. advertising expenditure by company and brand. COMMERCIAL

Lobbying and Political Spending

OpenSecrets (opensecrets.org) U.S. federal lobbying, campaign finance, and dark money. SECONDARY (compiled from primary filings)

EU Transparency Register Lobbying in the European Union. PRIMARY/SELF-REPORT (registration is mandatory but data is self-declared)

FollowTheMoney (followthemoney.org) U.S. state-level campaign finance. SECONDARY

Think Tank and Foundation Funding

IRS Form 990 Filings Tax returns for U.S. nonprofits; available via ProPublica Nonprofit Explorer. PRIMARY (legally required disclosures; incomplete for donor-advised funds)

InfluenceWatch (influencewatch.org) Profiles of foundations, think tanks, and advocacy organizations. SECONDARY/ADVOCACY (compiled by the Capital Research Center, a conservative-leaning organization; useful for mapping but interpret editorial framing critically)

Foundation Directory Online Comprehensive database of U.S. foundations and grants. SECONDARY

Atlas Network Annual Reports Self-reported data on the global network of free-market think tanks. SELF-REPORT (organizationally curated; independent verification recommended)

Media Ownership

Columbia Journalism Review (CJR) Who Owns What U.S. media ownership database.

Media Ownership Monitor (mom-gmr.org) Global media concentration data.

Ofcom Media Ownership Reports UK media ownership data.

Survey Data on Beliefs

World Values Survey Cross-national survey of values and beliefs (7 waves, 1981–present).

General Social Survey (GSS) U.S. attitudes and beliefs since 1972.

Eurobarometer EU-wide public opinion surveys.

Pew Research Center Global attitudes, media habits, and political beliefs.

ISSP (International Social Survey Programme) Cross-national surveys on specific topics.

Academic Funding

NSF Award Search U.S. National Science Foundation grants.

NIH Reporter U.S. National Institutes of Health funding.

OECD Science and Technology Indicators International R&D spending.

UnKoch My Campus Database of Koch-funded academic programs.

Text and Media Corpora

Google Ngrams Word frequency in books, 1500–2019.
GDELT Project Global media monitoring and event database.
Media Cloud Open-source media analysis platform.
Common Crawl Web archive for large-scale text analysis.
LexisNexis / Factiva Commercial news archives.

Platform Transparency

Meta Ad Library Political and social advertising on Facebook/Instagram.
Google Transparency Report Political ad spending on Google platforms.
Twitter/X Transparency Center Data on content moderation and advertising.

Sample Doxometric Survey Instruments

Status: The instruments below are **pilot items** intended to illustrate the structure of doxometric measurement. They have not been validated through factor analysis, invariance testing, or external criterion studies. Before use in research, they require: (a) exploratory factor analysis to assess dimensionality, (b) confirmatory factor analysis with holdout samples, (c) measurement invariance testing across demographic groups, (d) social desirability bias assessment, and (e) test-retest reliability estimation. Where validated instruments exist in the literature (e.g., Kluegel and Smith's stratification beliefs scale, Jost and colleagues' system justification measures), researchers should prefer those.

Instrument 1: Belief in Selfish Human Nature

Respondents rate agreement on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree).

1. Most people are primarily motivated by self-interest.
2. If given the chance, most people would take advantage of others.
3. Cooperation only happens when people are forced or incentivized.
4. People who help others usually expect something in return.
5. Competition is more natural to humans than cooperation.

R6. Most people are willing to help a stranger even when there is no reward. *(reverse-coded)*

R7. Humans naturally form cooperative communities without being forced. *(reverse-coded)*

R8. People generally try to be fair, even when no one is watching. *(reverse-coded)*

Scoring: Reverse-code items R6–R8 before summing. Range 8–56. Higher scores indicate stronger belief in selfish human nature. Internal consistency (Cronbach's α) should be assessed empirically; a threshold of $\alpha > 0.70$ is minimally acceptable.

Note: This instrument conflates beliefs about motivation, norm compliance, and institutional necessity. Exploratory factor analysis may reveal a multi-

factor structure (e.g., "cynicism about others" vs. "necessity of enforcement"). Researchers should test dimensionality before treating it as a single scale.

Instrument 2: Meritocratic Belief Scale

1. People who work hard almost always get ahead.
2. Success in life is mostly determined by effort and talent.
3. The wealthy generally deserve their wealth.
4. Everyone has a roughly equal opportunity to succeed.

R5. Success depends more on connections and family background than on individual effort. *(reverse-coded)*

R6. The economic system is set up in a way that gives some people unfair advantages. *(reverse-coded)*

Scoring: Reverse-code R5–R6 before summing. Range 6–42. Higher scores indicate stronger meritocratic belief.

Note: This scale folds together beliefs about effort, deservingness, equal opportunity, and poverty attribution. These may be distinct constructs; pilot testing should assess whether a single-factor model fits the data.

Instrument 3: Behavioral Vignette (Norm Misperception)

> *Imagine you find a wallet containing $200 and the owner's ID. No one is watching.*
>
> 1. *What would you do?* (Return it / Keep the money / Other)
> 2. *What do you think most people would do?* (Return it / Keep the money / Other)
> 3. *What percentage of people do you think would return it?* (0–100%)

The gap between own behavior (item 1) and perceived norm (items 2–3) measures the *norm misperception gap* (Definition 19.8). A large gap (most people say they would return it, but predict others would keep it) indicates doxonomic installation of selfishness as perceived norm.

General Methodological Notes

For all instruments:

- Reverse-code counter-directional items (marked R) before summing.
- Report Cronbach's α and factor loadings.
- Assess social desirability bias (e.g., include a short social desirability scale and partial out its effects).

- For cross-national use, test measurement invariance (configural, metric, scalar) across country groups.
- Compare stated-belief scores with behavioral measures to assess divergence (Proposition 13.2).
- Consider supplementing Likert items with list experiments or endorsement experiments to mitigate response bias on sensitive beliefs.

Network and Accounting Templates

This appendix provides templates for constructing doxonomic networks and accounting tables.

Template 1: Donor-Institution Adjacency Matrix

	Institution 1	Institution 2	Institution 3	$\cdots$
Donor A	\$_____	\$_____	\$_____	
Donor B	\$_____	\$_____	\$_____	
Donor C	\$_____	\$_____	\$_____	
$\vdots$				

Instructions: Fill in annual grant amounts from each donor to each institution. Data sources: IRS 990 filings, foundation annual reports, InfluenceWatch.

Template 2: Doxonomic Input-Output Table

To $\downarrow$ / From $\rightarrow$	Think tanks	Media	Universities	Gov't	Final output
Think tanks	–	a_{12}	a_{13}	a_{14}	d_1
Media	a_{21}	–	a_{23}	a_{24}	d_2
Universities	a_{31}	a_{32}	–	a_{34}	d_3
Gov't	a_{41}	a_{42}	a_{43}	–	d_4

Instructions: a_{ij} is the fraction of institution j's narrative output used as input by institution i. Estimate from citation patterns, sourcing data, and content analysis. Compute the Leontief inverse $(\boldsymbol{I} - \boldsymbol{A})^{-1}$ to find multiplier effects.

Template 3: Belief-Flow Account

Source	Institution	Channel	Amount ($)	Throughput (Θ)
Total			$_____	_____

Instructions: For a specific belief p, trace all identifiable funding flows from source through institution to channel. Estimate throughput as $\Theta_k = F_k \cdot C_k \cdot P_k$.

Suggested Datasets, Archives, and Corpora

This appendix lists datasets suitable for doxonomic research.

Dataset	Description
World Values Survey	Cross-national survey of beliefs and values in 100+ countries (1981–present). Core resource for doxometric measurement.
General Social Survey (GSS)	U.S. attitudes, behaviors, and beliefs since 1972. Annual or biennial.
Eurobarometer	EU-wide public opinion surveys on trust, institutions, and social values.
OpenSecrets Bulk Data	U.S. federal lobbying, PAC contributions, and outside spending. Machine-readable.
ProPublica Nonprofit Explorer	Searchable database of IRS 990 filings for U.S. nonprofits.
GDELT Project	Real-time global media monitoring: events, tone, themes, and locations.
Media Cloud	Open-source platform for analyzing media ecosystems and narrative flows.
Google Ngrams	Word and phrase frequency in the Google Books corpus (1500–2019).
Google Trends	Search interest over time by region. Proxy for public attention.
Common Crawl	Petabyte-scale web archive for large-scale text analysis.
Facebook Ad Library	Archive of political and social issue advertisements on Meta platforms.
OECD Education at a Glance	Cross-national data on education spending, enrollment, and curricula.
UNESCO Institute for Statistics	Global data on media, education, and cultural spending.
Pew Global Attitudes	Cross-national surveys on democracy, economics, technology, and social values.

Dataset	Description
ISSP	International Social Survey Programme: annual thematic cross-national surveys.
ICPSR	Inter-university Consortium for Political and Social Research: massive archive of social science datasets.
HathiTrust Digital Library	17+ million digitized volumes for computational text analysis.
Internet Archive	Web and media archives including the Wayback Machine.
InfluenceWatch	Profiles and funding data for advocacy organizations, unions, and think tanks.
Corporate Europe Observatory	Data on EU corporate lobbying and revolving doors.

Replication Exercises

These exercises guide the reader through replicating key doxonomic analyses using real data.

Exercise 1: Epistemic Herfindahl Index for U.S. Cable News

Goal: Compute EHI for the U.S. cable news market.

Data: Nielsen audience share data (available from Pew Research Center's annual "State of the News Media" reports).

Steps:

1. Obtain average primetime viewership for CNN, Fox News, MSNBC, and other cable news channels.
2. Compute market shares $s_k = \text{viewership}_k / \text{total viewership}$.
3. Compute EHI $= \sum_k s_k^2$.
4. Interpret: is the cable news market concentrated by doxonomic standards (EHI > 0.25)?
5. Repeat for 2005, 2010, 2015, 2020. Plot the trend.

Exercise 2: Donor Network of Free-Market Think Tanks

Goal: Construct a donor-institution network for U.S. free-market think tanks.

Data: IRS 990 filings via ProPublica Nonprofit Explorer; InfluenceWatch profiles.

Steps:

1. Select 10 major think tanks (Heritage Foundation, Cato Institute, AEI, Hoover, Manhattan Institute, etc.).
2. For each, identify the top 5 foundation donors from 990 filings.
3. Construct a bipartite network (donors $\times$ institutions) with edge weights = grant amounts.
4. Compute eigenvector centrality for all nodes.
5. Identify narrative clusters using modularity maximization.

Exercise 3: Semantic Drift of "Freedom"

Goal: Measure how the word "freedom" has changed meaning in American political discourse.

Data: Google Ngrams or a corpus of presidential speeches.

Steps:

1. Train word embeddings (Word2Vec or GloVe) on decade-specific subcorpora.
2. Extract the embedding vector for "freedom" in each decade.
3. Compute cosine distance between consecutive decades.
4. Identify the decade with maximum drift.
5. Examine nearest neighbors of "freedom" in each period to interpret the drift.

Exercise 4: Meritocratic Belief Across Countries

Goal: Compare meritocratic belief across 20 countries.

Data: World Values Survey (items on effort, success, fairness).

Steps:

1. Select relevant items from WVS Wave 7.
2. Construct a meritocratic belief index (factor analysis or simple sum).
3. Plot country-level means against Gini coefficients.
4. Test the hypothesis: does higher inequality correlate with stronger meritocratic belief (legitimation function)?

Exercise 5: Narrative Entropy of Climate Discourse

Goal: Measure narrative diversity in media coverage of climate change over time.

Data: Media Cloud or GDELT.

Steps:

1. Collect climate-related articles from 2000–2024.
2. Apply LDA topic modeling with $K = 10$ topics.
3. Compute narrative entropy $H(t) = -\sum_k p_k(t) \log p_k(t)$ for each year.
4. Plot $H(t)$ over time. Identify periods of low entropy (narrative capture).
5. Correlate entropy changes with known doxonomic events (e.g., fossil fuel campaign spending).

Recommended Reading

Organized by topic, with brief annotations.

Political Economy

- Marx and Engels (1846):The foundational text on ideology as material production.
- Polanyi (1944):How markets were politically constructed, not naturally emergent.
- North (1990):Institutions as the rules of the game shaping economic behavior.
- Acemoglu and Robinson (2012):How political institutions determine economic outcomes.
- Piketty (2014):The dynamics of wealth concentration and its legitimation.
- Stiglitz (2012):How inequality is maintained through institutional design.
- Streeck (2016):The contradictions of contemporary capitalism.
- Harvey (2005):The institutional history of neoliberalism.

Sociology of Knowledge and Symbolic Power

- Bourdieu (1984):The social production of taste, distinction, and doxa.
- Bourdieu (1991):Language as an instrument of symbolic power.
- Gramsci (1971):Hegemony and the production of consent through civil society.
- Foucault (1981):The rules governing what counts as knowledge.
- Lukes (2005):Three dimensions of power, including the power to shape desires.
- Scott (1998):How states impose legibility on complex social realities.
- Eyal (2019):The sociology of expertise and its social authority.

Propaganda, Media, and Public Opinion

- Lippmann (1922):The manufacture of public opinion through media.
- Dewey (1927):The public, communication, and democratic life.

- Bernays (1928):The engineering of consent as a professional practice.
- Adorno and Horkheimer (1944):The culture industry and mass deception.
- Herman and Chomsky (1988):The propaganda model of media: five structural filters.
- McChesney (1999):Corporate media and the erosion of democratic communication.
- Bagdikian (2004):Media ownership concentration and its effects.
- Zuboff (2019):Surveillance capitalism and the commodification of behavior.
- Sunstein (2017):Echo chambers and the fragmentation of public discourse.

Behavioral Science and Cooperation

- Kahneman (2011):Cognitive biases and dual-process theory.
- Fischbacher et al. (2001):Experimental evidence for conditional cooperation.
- Henrich et al. (2001):Cross-cultural evidence against homo economicus.
- Bowles and Gintis (2011):Cooperation as an evolved human capacity.
- Ostrom (1990):Self-governance of commons without external coercion.
- Gintis et al. (2005):Moral sentiments and material interests in economic behavior.
- Nowak (2006):Evolutionary mechanisms for cooperation.

Formal Methods

- Jackson (2008):Network theory for social and economic systems.
- Schelling (1978):Micromotives, macrobehavior, and threshold effects.
- Granovetter (1978):Threshold models of collective behavior.
- Pearl (2009):Structural causal models and DAGs.
- Angrist and Pischke (2009):Causal inference for empirical research.
- Blei, Ng, et al. (2003):Latent Dirichlet Allocation for text analysis.
- Shannon (1948):Information theory: entropy and communication.

Case Studies and Applied Doxonomics

- Oreskes and Conway (2010):How doubt was manufactured about climate science and tobacco.
- Mayer (2016):The dark-money network behind American conservatism.
- Mirowski and Plehwe (2009):The institutional history of neoliberal thought.
- Klein (2007):Crisis as an opportunity for doxonomic capture.
- Mudge (2018):How left parties adopted neoliberal frameworks.
- Brown (2015):Neoliberalism and the undoing of democratic subjectivity.

- Graeber (2011):The doxonomic history of debt and moral obligation.

Alternatives and Futures

- Wright (2010):Real utopias: institutional designs for a more just society.
- Benkler (2006):Networked information economy and peer production.
- Sen (1999):Development as the expansion of capabilities.
- Freire (1968):Critical pedagogy and the education of political consciousness.
- Srnicek and Williams (2015):Post-work futures and counter-hegemonic strategy.
- Mason (2015):Postcapitalism and the information economy.

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Abadie, A., A. Diamond, and J. Hainmueller (2010). "Synthetic Control Methods for Comparative Case Studies". In: *Journal of the American Statistical Association* 105.490, pp. 493–505.

Acemoglu, D., V. Chernozhukov, and M. Yildiz (2016). "Fragility of Asymptotic Agreement under Bayesian Learning". In: *Theoretical Economics* 11.1, pp. 187–225.

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Index

accounting identity, 163
accounting uncertainty, 164
advertising, 290
affective orientation, 19
affective recruitment, 270
agent, 37
agent-based model, 129
agnotology, 105
agonistic democracy, 407
AI narratives, 363
algorithmic entropy, 362
algorithmic infrastructure, 83
analytical symmetry, 251
anthropological regime, 17
  competition, 271
  examples, 18
anti-technocracy principle, 427
archival triangulation, 216
asymmetric warfare, 400
asymptotic capture, 53
attention economy, 294
attention tax, 294
audience, 44
audience resistance, 44
audit and evaluation, separation of, 20
austerity
  distributional effects, 333
austerity belief, 332

basic reproduction number, 124
Bayes factor, 247
Bayesian updating
  asymmetric, 126
belief, 13
belief distribution, 21
belief ecology, 415
belief equation, 5
belief production chain, 6, 49
belief trajectory, 155
belief-flow accounting, 159
  climate example, 160
  expanded, 166
bifurcation, 385
  funding, 123
bistability, 123
broker power, 173
budget, 42

capital conversion, 67
  pathways, 67
capture
  detection, 94
capture cost, 90
centrality, 170
channel, 40
channel portfolio, 41
citation network, 207
civilizational narrative, 353
coefficient stability, 246
coherence dynamics, 141
coloniality, 32, 317
common sense, 14
common-sense capture, 87
  formal definition, 87
comparative-historical method, 220
competitive exclusion, 129
compound legitimation, 308

concentration
  welfare effects, 117
concept capture, 204
conditional treatment effect, 180
conjoint experiment, 234
conservative advantage, 376
consumerism
  regime, 292
contradiction
  doxonomic, 387
conversion problem, 5
coordination
  counter-doxonomic, 402
corporate meritocracy, 279
corpus, 197
corpus bias, 198
correction experiment, 234
cost function, 111
counter-doxonomics, 396
  optimization, 400
counter-institution design, 397
credential laundering, 281
credibility
  destruction-construction asymmetry, 69
  lemons problem, 72
credibility attack, 69
credibility cascade, 387
credibility collapse, 387
credibility laundering, 39
  academic, 329
credibility premium, 51
crisis doxonomics, 369
crisis narrative game, 374
critical stress, 386
critique
  as gluing, 142
crowding out, 91
culture industry, 29
curriculum experiment, 233

d-separation, 188
dark money, 51
de-capture, 95
debt morality, 326
deliberative mini-public, 409
depoliticization, 295
design tradeoffs, 416
difference-in-differences, 183
distortion index, moral, 269
do what you love, 344
dominance index, 154
dose-response, 230
doubt production, 105
doxa, 15
  formal definition, 15
doxometrics, 149
doxonomic balance sheet, 119
doxonomic equilibrium, 55
doxonomic externality, 115
doxonomic force, 66
doxonomic game, 227
doxonomic market, 114
doxonomic multiplier, 57, 162
doxonomic network, 169
  types, 170
doxonomic paradox, 430
doxonomic power, 99
  climate example, 100
doxonomic power index, 106
doxonomic preparedness, 376
doxonomic stability, 46
doxonomic system, 4
doxonomic technocracy, 426
doxonomic trap, 267
doxonomics, 3
dual use, 427

Easterlin paradox, 297
economics education, 264
education pipeline, 264
effective concentration, 81
emergent alignment, 102
endemic equilibrium, 124
epistemic broker, 173
epistemic capital, 65
  interactions, 70
  profiles, 66

epistemic democracy, 405
epistemic fragmentation, 140
epistemic Gini coefficient, 71
epistemic Herfindahl index, 80
  formal, 117
epistemic humility, 250
epistemic injustice, 105
  forms, 106
epistemic lemons problem, 72
epistemic paternalism, 411
epistemic pluralism, 408
epistemic public good, 410
epistemic rent, 68
epistemic rule-setting
  economics, 101
epistemic violence, 317
equilibrium selection, 56
exposure asymmetry, 52
exposure distribution, 52

fear, 371
  complexity tradeoff, 372
feedback loop, 45
fiscal framing, 335
fiscal morality, 326
fragmentation
  strategic implications, 141
frame, 199
frame prevalence, 201
framing bias, 152
funding advantage, 129
funding chain, 161
funding disclosure, 401
funding opacity, 161

gender regime, 318
  production model, 319
genealogy, 213
generational decay, 388
generational reproduction, 56
gluing obstruction, 137

habitus, 19
hedonic treadmill, 291
hegemony, 27
herd immunity
  doxonomic, 125
hidden transfer, 118
historical memory, 352
homo economicus, 261
hustle culture, 343

identity commitment, 19
ideological hazard, 244
ideological ROI, 113
ideological state apparatus, 27
ideology, 14
  as obstruction management, 138
inevitability
  production model, 365
inevitability narrative, 364
information cascade, 127
  fragility, 128
information commons, 417
  governance, 418
infrastructure roles, 76
infrastructure vulnerability, 81
innovation discourse, 361
inoculation
  model, 125
inoculation program, 399
input-output model, 57
input-output table, 162
institution
  processing function, 39
institutional capacity, 39
institutional embeddedness, 154
institutional saturation, 90
instrumental variable, 185
interference, 191
internalization
  augmented model, 54
intersectionality, 320
item response theory, 153

labor discipline, 341
latent variable model, 152
layered ontology, 19
legitimation, 302

legitimation cost, 282, 303
legitimation dynamics, 308
list experiment, 151, 235
local belief system, 136
lock-in, 92
Lotka-Volterra model, 128

manufactured desire, 291
market failure
  belief production, 114
Marx, 27
material persistence, 352
material-narrative gap, 388
measurement invariance, 152
mechanism design, 409
media boundary design, 182
media field experiment, 233
media literacy, 398
meritocracy, 277
  feedback model, 283
meritocratic belief
  model, 282
mixed methods, 222
model selection, 131
moral distortion index, 269
moral frame concentration, 203
motivated reasoning, 54
multiplex network, 170
mutual information
  doxonomic, 206
myth maintenance, 350

narrative, 43
narrative cluster, 172
  example, 172
narrative diffusion, 207
narrative distance, 43
narrative divergence, 205
narrative entropy, 205
narrative infrastructure, 75
narrative inoculation, 399
narrative pathway, 79
narrative pipeline, 76
narrative range, 102
narrative shield, 305
narrative throughput, 78
narrative vacuum, 373
national myth, 349
network evolution, 175
network resilience, 176
norm information experiment, 232
norm misperception, 231

observer effect, 425
open problems, 435
operationalized belief, 149
opinion, 14
optimal belief ecology, 419
optimal entropy, 410
optimal incoherence, 139
overfitting, 243
Overton window, 372
  capture, 373

parallel trends, 183
partial fracture, 389
path dependence
  infrastructure, 83
perceived norm, 231
periodization, 218
persistence, 231
phase transition, 370
Pigouvian tax
  doxonomic, 116
placebo test, 246
platform ideology, 361
pluralistic ignorance, 16
polarization, 126
policy feedback, 271
post-fracture outcomes, 390
power analysis, 236
power-resistance dialectic, 107
precarity, 343
predictive validation, 244
preference falsification, 16
priming experiment, 229
prior-setting power, 103
  dynamics, 104

process tracing, 221
processing loss, 52
productive incoherence, 139
propagation speed, 174
prospect of upward mobility, 304
public media, 407

racial regime, 313
  production model, 315
regime change
  funding threshold, 271
regression discontinuity, 190
reliability, 153
research ethics, 429
resilience paradox, 391
resource asymmetry, 395

scale-free network
  vulnerability, 176
segregation
  doxonomic feedback, 315
self-exploitation, 341
self-fulfilling belief, 55
self-fulfilling prophecy, 266
semantic drift, 203
sensitivity analysis, 192, 245
sheaf
  belief sheaf, 137
shock doctrine, 329
SIR model, 124
SIRV model, 125
slow crisis, 375
social desirability bias, 151
social norm, 19
social proof, 54
social proof cascade, 91
source credibility, 230
spectral gap, 175
stock-and-flow model, 122
structural advantage, 80
structural alignment, 102
synthetic control, 188
system justification, 306

tacit classification, 19
technological determinism, 359
threshold model, 88
tipping point, 88
  example, 89
topic model, 201
transition maps, 138
transition pathway, 419
transparency principle, 426
treatment effect, 179
triangulation, 248
triangulation scorecard, 249

uncertainty interval, 242
uncertainty propagation, 242
uncertainty quantification, 241

weakest link, 58
wealth-virtue association, 303
work ethic, 339
  employer value, 341