THE ATLAS OF SOCIAL COMPLEXITY

Brian Castellani
Durham University, UK

Lasse Gerrits
Erasmus University, NL

Castellani, Brian and Gerrits, Lasse. Forthcoming 2024. The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution

OPENING ARGUMENT

- Although the complexity sciences have done much to advance the social sciences, over the last decade the field has run into some hard situations – thirteen to be exact.
- Some are self-imposed, others come from how 21st century science is conducted.
- Examples include
  - ignoring the wider social sciences
  - privileging computational modelling over qualitative research
  - being tone-deaf about the real world.
- These situations presently prevent the study of social complexity from becoming the disruptive, transdisciplinary field it originally sought to be in the 1990s when the *complexity turn* in the social sciences took place.

Castellani, Brian and Gerrits, Lasse. Forthcoming 2
The Atlas for Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistributio

OPENING ARGUMENT

- Fortunately, a small but growing global network of scholars are charting new territory.
- **They are part of a fresh turn in complexity, the *social science turn***, which fosters a transdisciplinary, social complexity imagination that, in one way or another, addresses the field's thirteen situations to create new areas of disruptive and highly innovative social inquiry.
- The ***Atlas of social complexity*** charts this new territory, seeking to map its present future.
- Organised around **SIX THEMES**, the Atlas functions as a tour guide, surveying over thirty leading-edge research areas (some still under construction) that readers can variously combine and develop.

Castellani, Brian and Gerrits, Lasse. For
The Atlas of Social Complexity. Edward Elga
Slides are copyrighted and not for redistribution

OPENING ARGUMENT

- The Atlas is a practical guide for those seeking new ideas and new avenues of study to pursue, all in the hope of fostering the transdisciplinary social complexity imagination needed to address some of the biggest global challenges we, as a world community, presently face.
- **The purpose of this LECTURE is to introduce the Atlas to foster a discussion on the future of the field and for participants to explore what a future map might look like for YOUR WORK in the FIELD OF PSYCHOLOGY.**

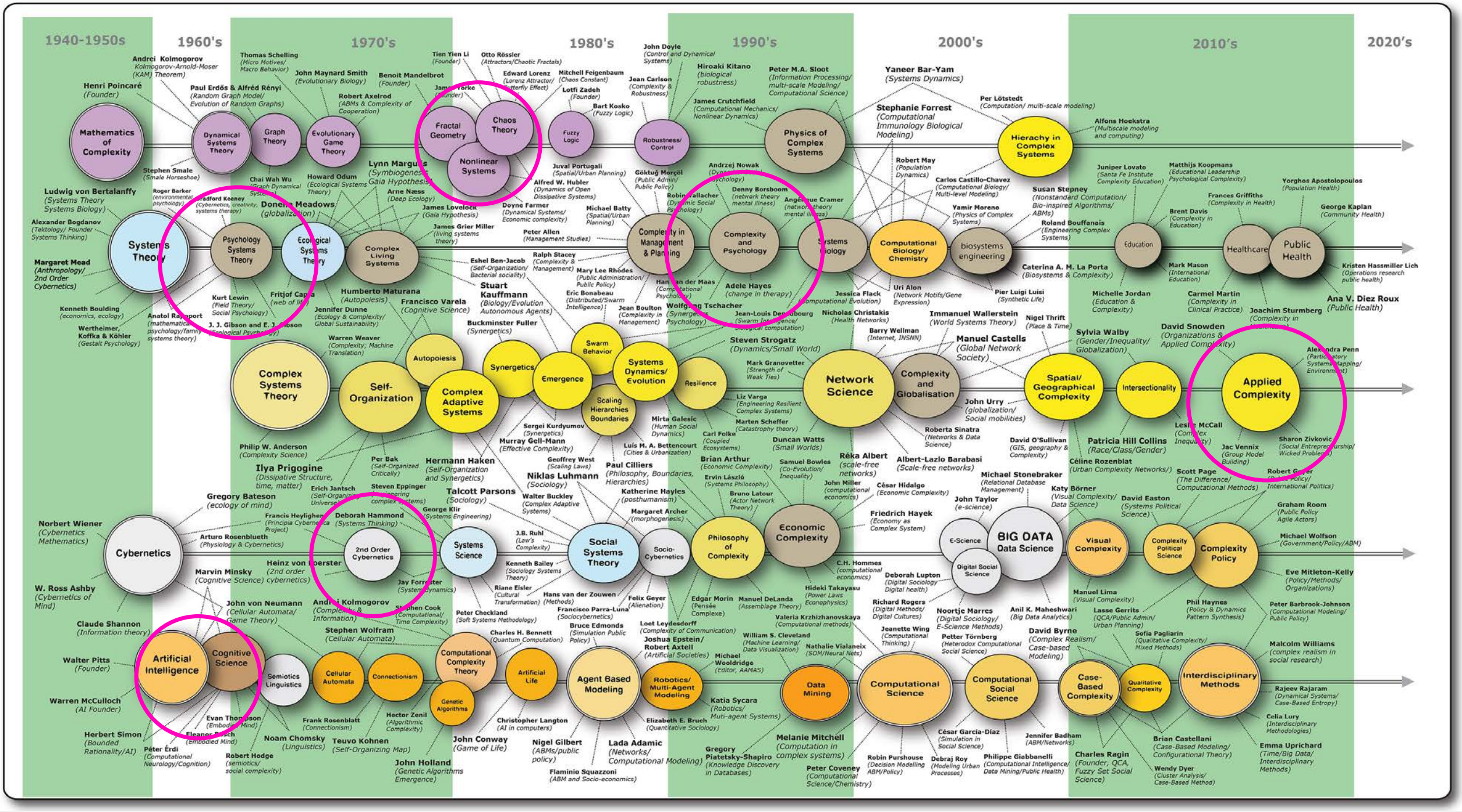
Castellani, Brian and Gerrits, Lasse. Forthcoming 2
The Atlas of Social Complexity. Edward Elgar
Slides are copyrighted and not for redistribution

OVERVIEW

- **Mapping current terrain**
  - Thirteen challenges facing the study of social complexity
- **Charting new territory**
  - The *Atlas of social complexity* charts this new territory, seeking to map its present future.
- **Organised around six major themes:**
  - Setting the context
  - Cognition, emotion and consciousness
  - Dynamics of human psychology
  - Living in social systems
  - Advancing a new methods agenda
  - The unfinished space

A BIT OF HISTORY

Castellani, Brian and Gerrit Roose. Forthcoming 2024.
The Atlas of Social Complexity. Edward Elgar.
All rights are copyrighted and not for redistribution


1940-1950s
1960's
1970's
1980's
1990's
2000's
2010's
2020's
Mathematics of Complexity
Dynamical Systems Theory
Graph Theory
Evolutionary Game Theory
Fractal Geometry
Chaos Theory
Nonlinear Systems
Fuzzy Logic
Robustness/ Control
Physics of Complex Systems
Hierarchy in Complex Systems
Systems Theory
Psychology Systems Theory
Ecological Systems Theory
Complex Living Systems
Complexity in Management & Planning
Complexity and Psychology
Systems Biology
Computational Biology/ Chemistry
biosystems engineering
Education
Healthcare
Public Health
Complex Systems Theory
Self-Organization
Autopoiesis
Complex Adaptive Systems
Synergetics
Emergence
Swarm Behavior
Systems Dynamics/ Evolution
Resilience
Network Science
Complexity and Globalisation
Spatial/ Geographical Complexity
Intersectionality
Applied Complexity
Cybernetics
2nd Order Cybernetics
Systems Science
Social Systems Theory
Socio-Cybernetics
Philosophy of Complexity
Economic Complexity
E-Science
Digital Social Science
BIG DATA Data Science
Visual Complexity
Complexity Political Science
Complexity Policy
Artificial Intelligence
Cognitive Science
Semiotics Linguistics
Cellular Automata
Connectionism
Computational Complexity Theory
Genetic Algorithms
Artificial Life
Agent Based Modeling
Robotics/ Multi-Agent Modeling
Data Mining
Computational Science
Computational Social Science
Case-Based Complexity
Qualitative Complexity
Interdisciplinary Methods
Ludwig von Bertalanffy (Systems Theory Systems Biology)
Henri Poincaré (Founder)
Andrei Kolmogorov (Kolmogorov-Arnold-Moser (KAM) Theorem)
Paul Erdős & Alfréd Rényi (Random Graph Model/ Evolution of Random Graphs)
Thomas Schelling (Micro Motives/ Macro Behavior)
John Maynard Smith (Evolutionary Biology)
Benoit Mandelbrot (Founder)
Robert Axelrod (ABMs & Complexity of Cooperation)
Stephen Smale (Smale Horseshoe)
Chai Wah Wu (Graph Dynamical Systems)
Howard Odum (Ecological Systems Theory)
Lynn Margulis (Symbiogenesis/ Gaia Hypothesis)
Arne Næss (Deep Ecology)
Roger Barker (environmental psychology)
Bradford Keeney (Cybernetics, creativity, systems therapy)
Donella Meadows (globalization)
James Lovelock (Gaia Hypothesis)
James Grier Miller (living systems theory)
Alexander Bogdanov (Tektology/ Founder Systems Thinking)
Margaret Mead (Anthropology/ 2nd Order Cybernetics)
Kenneth Boulding (economics, ecology)
Wertheimer, Koffka & Köhler (Gestalt Psychology)
Anatol Rapoport (mathematical psychology/family systems theory)
Kurt Lewin (Field Theory/ Social Psychology)
Fritjof Capra (web of life)
J. J. Gibson and E. J. Gibson (Ecological Psychology)
Jennifer Dunne (Ecology & Complexity/ Global Sustainability)
Humberto Maturana (Autopoiesis)
Francisco Varela (Cognitive Science)
Warren Weaver (Complexity; Machine Translation)
Buckminster Fuller (Synergetics)
Stuart Kauffmann (Biology/Evolution Autonomous Agents)
Eshel Ben-Jacob (Self-Organization/ Bacterial sociality)
Ralph Stacey (Complexity & Management)
Mary Lee Rhodes (Public Administration/ Public Policy)
Eric Bonabeau (Distributed/Swarm Intelligence)
Jean Boulton (Complexity in Management)
Wolfgang Tschacher (Synergetics Psychology)
Jean-Louis Deneubourg (Swarm Intelligence/ Biological computation)
Hannah van der Maas (Computational Psychology)
Adele Hayes (change in therapy)
Nicholas Christakis (Health Networks)
Jessica Flack (Computational Evolution)
Uri Alon (Network Motifs/Gene Expression)
Pier Luigi Luisi (Synthetic Life)
Caterina A. M. La Porta (Biosystems & Complexity)
Roland Bouffanais (Engineering Complex Systems)
Susan Stepney (Nonstandard Computation/ Bio-inspired Algorithms/ ABMs)
Carlos Castillo-Chavez (Computational Biology/ Multi-level Modeling)
Yamir Moreno (Physics of Complex Systems)
Robert May (Population Dynamics)
Stephanie Forrest (Computational Immunology Biological Modeling)
Per Lötstedt (Computation/ multi-scale modeling)
Alfons Hoekstra (Multiscale modeling and computing)
Juniper Lovato (Santa Fe Institute Complexity Education)
Matthijs Koopmans (Educational Leadership Psychological Complexity)
Frances Griffiths (Complexity in Health)
Yorghos Apostolopoulos (Population Health)
Brent Davis (Complexity in Education)
George Kaplan (Community Health)
Michelle Jordan (Education & Complexity)
Mark Mason (International Education)
Carmel Martin (Complexity in Clinical Practice)
Joachim Sturmberg (Complexity in)
Kristen Hassmiller Lich (Operations research public health)
Ana V. Diez Roux (Public Health)
Steven Strogatz (Dynamics/Small World)
Mark Granovetter (Strength of Weak Ties)
Barry Wellman (Internet, INSNN)
Immanuel Wallerstein (World Systems Theory)
Manuel Castells (Global Network Society)
Nigel Thrift (Place & Time)
Sylvia Walby (Gender/Inequality/ Globalization)
David Snowden (Organizations & Applied Complexity)
Alexandra Penn (Participatory Systems Mapping/ Environment)
John Urry (globalization/ Social mobilities)
Roberta Sinatra (Networks & Data Science)
David O'Sullivan (GIS, geography & Complexity)
Patricia Hill Collins (Race/Class/Gender)
Céline Rozenblat (Urban Complexity Networks/)
Leslie McCall (Complex Inequality)
Jac Vennix (Group Model Building)
Sharon Zivkovic (Social Entrepreneurship/ Wicked Problems)
Liz Varga (Engineering Resilient Complex Systems)
Marten Scheffer (Catastrophy theory)
Duncan Watts (Small Worlds)
Réka Albert (scale-free networks)
Albert-Lazlo Barabasi (Scale-free networks)
Samuel Bowles (Co-Evolution/ Inequality)
Brian Arthur (Economic Complexity)
John Miller (computational economics)
César Hidalgo (Economic Complexity)
Ervin László (Systems Philosophy)
Bruno Latour (Actor Network Theory)
Friedrich Hayek (Economy as Complex System)
Michael Stonebraker (Relational Database Management)
John Taylor (e-science)
Katy Börner (Visual Complexity/ Data Science)
David Easton (Systems Political Science)
Scott Page (The Difference/ Computational Methods)
Robert Geyer (Complexity Policy/ International Politics)
Graham Room (Public Policy Agile Actors)
Michael Wolfson (Government/Policy/ABM)
Eve Mitleton-Kelly (Policy/Methods/ Organizations)
Peter Barbrook-Johnson (Computational Modeling/ Public Policy)
Malcolm Williams (complex realism in social research)
Rajeev Rajaram (Dynamical Systems/ Case-Based Entropy)
Celia Lury (Interdisciplinary Methodologies)
Emma Uprichard (Time/Big Data/ Interdisciplinary Methods)
Brian Castellani (Case-Based Modeling/ Configurational Theory)
Wendy Dyer (Cluster Analysis/ Case-Based Method)
Charles Ragin (Founder, QCA, Fuzzy Set Social Science)
Jennifer Badham (ABM/Networks)
Philippe Giabbanelli (Computational Intelligence/ Data Mining/Public Health)
César García-Díaz (Simulation in Social Science)
Debraj Roy (Modeling Urban Processes)
Robin Purshouse (Decision Modelling ABM/Policy)
Peter Coveney (Computational Science/Chemistry)
Melanie Mitchell (Computation in complex systems)
Gregory Piatetsky-Shapiro (Knowledge Discovery in Databases)
Petter Törnberg (Heterodox Computational Social Science)
Noortje Marres (Digital Sociology/ E-Science Methods)
Anil K. Maheshwari (Big Data Analytics)
Richard Rogers (Digital Methods/ Digital Cultures)
Deborah Lupton (Digital Sociology Digital health)
C.H. Hommes (computational economics)
Hideki Takayasu (Power Laws Econophysics)
Valeria Krzhizhanovskaya (Computational methods)
Jeanette Wing (Computational Thinking)
David Byrne (Complex Realism/ Case-based Modeling)
Sofia Pagliarin (Qualitative Complexity/ Mixed Methods)
Manuel Lima (Visual Complexity)
Lasse Gerrits (QCA/Public Admin/ Urban Planning)
Phil Haynes (Policy & Dynamics Pattern Synthesis)
Edgar Morin (Pensée Complexe)
Manuel DeLanda (Assemblage Theory)
Felix Geyer (Alienation)
Hans van der Zouwen (Methods)
Francisco Parra-Luna (Sociocybernetics)
Loet Leydesdorff (Complexity of Communication)
Joshua Epstein/ Robert Axtell (Artificial Societies)
Michael Wooldridge (Editor, AAMAS)
Nathalie Vialaneix (SOM/Neural Nets)
William S. Cleveland (Machine Learning/ Data Visualization)
Katia Sycara (Robotics/ Muti-agent Systems)
Elizabeth E. Bruch (Quantitative Sociology)
Lada Adamic (Networks/ Computational Modeling)
Flaminio Squazzoni (ABM and Socio-economics)
Nigel Gilbert (ABMs/public policy)
Christopher Langton (AI in computers)
John Conway (Game of Life)
John Holland (Genetic Algorithms Emergence)
Hector Zenil (Algorithmic Complexity)
Frank Rosenblatt (Connectionism)
Teuvo Kohonen (Self-Organizing Map)
Noam Chomsky (Linguistics)
Robert Hodge (semiotics/ social complexity)
Péter Érdi (Computational Neurology/Cognition)
Herbert Simon (Bounded Rationality/AI)
Warren McCulloch (AI Founder)
Walter Pitts (Founder)
Claude Shannon (Information theory)
W. Ross Ashby (Cybernetics of Mind)
Norbert Wiener (Cybernetics Mathematics)
Gregory Bateson (ecology of mind)
Arturo Rosenblueth (Physiology & Cybernetics)
Francis Heylighen (Principia Cybernetica Project)
Deborah Hammond (Systems Thinking)
Heinz von Foerster (2nd order cybernetics)
Marvin Minsky (Cognitive Science)
John von Neumann (Cellular Automata/ Game Theory)
Andrei Kolmogorov (Complexity & Information)
Stephen Wolfram (Cellular Automata)
Stephen Cook (Computational/ Time Complexity)
Peter Checkland (Soft Systems Methodology)
Charles H. Bennett (Quantum Computation)
Bruce Edmonds (Simulation Public Policy)
Michael Batty (Spatial/Urban Planning)
Juval Portugali (Spatial/Urban Planning)
Alfred W. Hubler (Dynamics of Open Dissipative Systems)
Doyne Farmer (Dynamical Systems/ Economic complexity)
Peter Allen (Management Studies)
Göktuğ Morçöl (Public Admin/ Public Policy)
Robin Gallacher (Dynamic Social Psychology)
Andrzej Nowak (Dynamic Psychology)
Denny Borsboom (network theory mental illness)
Angélique Cramer (network theory mental illness)
Per Bak (Self-Organized Criticality)
Hermann Haken (Self-Organization and Synergetics)
Erich Jantsch (Self-Organizing Universe)
Steven Eppinger (Engineering complex systems)
Talcott Parsons (Sociology)
George Klir (Systems Engineering)
Niklas Luhmann (Sociology)
Walter Buckley (Complex Adaptive Systems)
Sergei Kurdyumov (Synergetics)
Murray Gell-Mann (Effective Complexity)
Philip W. Anderson (Complexity Science)
Ilya Prigogine (Dissipative Structure, time, matter)
Geoffrey West (Scaling Laws)
Paul Cilliers (Philosophy, Boundaries, Hierarchies)
Luís M. A. Bettencourt (Cities & Urbanization)
Mirta Galesic (Human Social Dynamics)
Carl Folke (Coupled Ecosystems)
Scaling Hierarchies Boundaries
Jay Forrester (System dynamics)
Kenneth Bailey (Sociology Systems Theory)
Riane Eisler (Cultural Transformation)
J.B. Ruhl (Law's Complexity)
Katherine Hayles (posthumanism)
Margaret Archer (morphogenesis)
Bart Kosko (Fuzzy Logic)
Jean Carlson (Complexity & Robustness)
Hiroaki Kitano (biological robustness)
James Crutchfield (Computational Mechanics/ Nonlinear Dynamics)
Peter M.A. Sloot (Information Processing/ multi-scale Modeling/ Computational Science)
Yaneer Bar-Yam (Systems Dynamics)
Tien Yien Li (Founder)
Otto Rössler (Attractors/Chaotic Fractals)
Edward Lorenz (Lorenz Attractor/ Butterfly Effect)
Mitchell Feigenbaum (Chaos Constant)
Lotfi Zadeh (Founder)
Jim Yorke (Founder)

THE THIRTEEN CHALLENGES

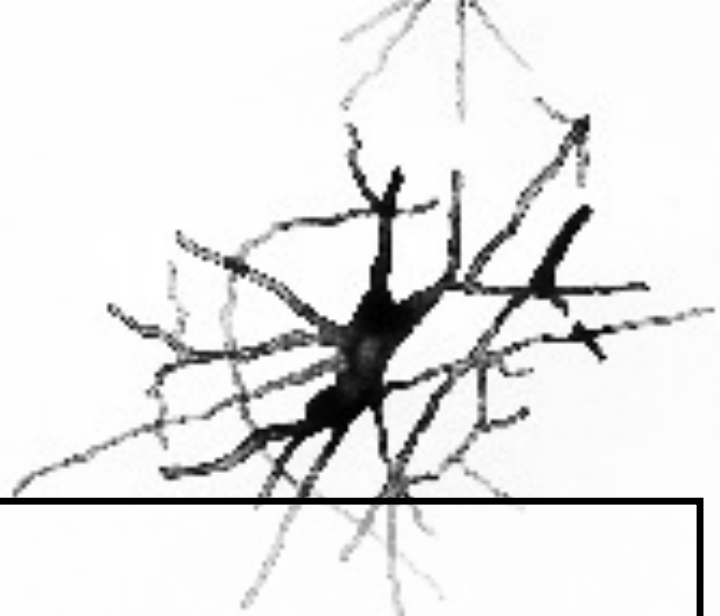
Situation	Characteristics
1. No philosophy of complexity	Few attempts to define an epistemology and ontology for social complexity
2. A failure to engage the wider social sciences	Assumption that the social sciences can be ignored because the complexity sciences would offer superior insights
3. Reinventing the wheel	Reinventing existing insights from the social sciences that are then presented as new insights
4. Old words, new words	Rebranding existing insights using terms from the complexity sciences
5. Obscurantism and mystification	Scientific overreach and complicated jargon combine to suggest that life's biggest questions are uncovered
6. The need for multilevel thinking and modelling	Despite the transdisciplinary approach of social complexity, almost all research focuses on a single level of analysis.
7. Technique in the absence of theory	Focus on computational methods and big data pushes social theory out of sight
8. Learning tools vs. predictive machines	The ability to learn from simulations is replaced by a desire to predict and control social complexity
9. Minor role of qualitative research	Dominance of quantitative research and quantification of data established a blind spot for qualitative data and methods
10. Methodological closing of social scientific mind	Shying away from advances in computational methods sees many social scientists becoming illiterate with such methods
11. The dire sound of technicalities	Going into a spiral of ever-smaller technical refinement while losing the bigger picture out of sight.
12. Being tone-deaf about the real world	Advanced analyses are coupled to crude recommendations that fail to appreciate the complexity in the target domain
13. Practice does not make perfect	Pragmatic and rushed adoption of the complexity sciences by practitioners constitutes verbal detritus

Castellani, Brian and Gerrits, Lasse. Forthcoming 2024.
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution.

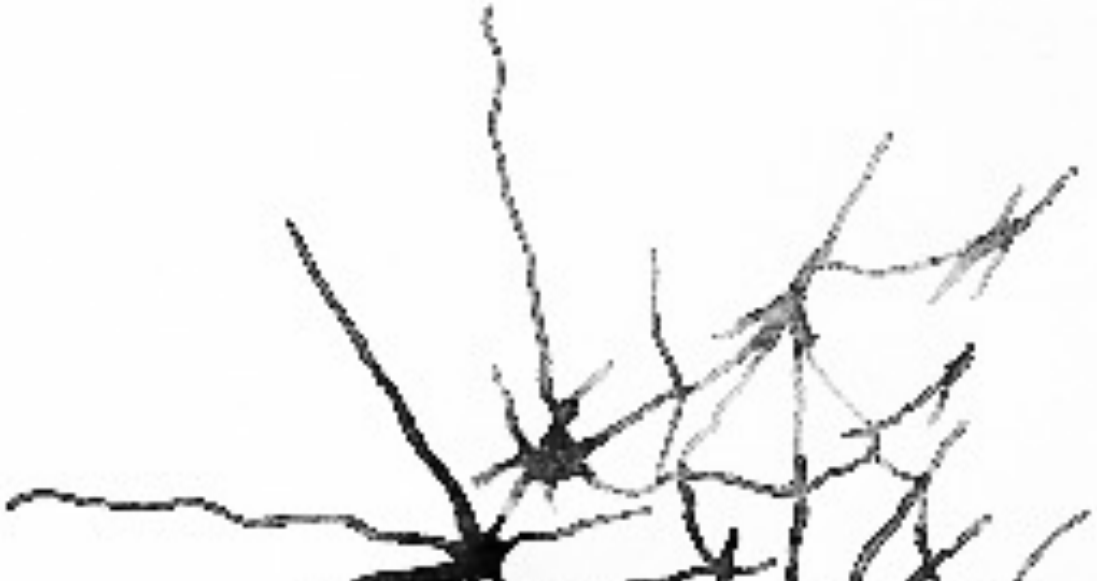
THE SOCIAL COMPLEXITY IMAGINATION

- **BACK TO THE FUTURE**
- In the spirit of C. Wright Mills, the best way for the study of social complexity to overcome its current limitations and to become truly transdisciplinary is to reembrace a social complexity imagination.
  - Imagination 1: Moving beyond the traps
  - Imagination 2. Observing the larger universe
  - Imagination 3. Accepting complexity psychologically
  - Imagination 4. Adopting a critical complexity
- This time, however, the inspiration comes from a different direction: it comes from a direct engagement with the social sciences, practice, policy and the arts, in particular those areas that don't associate themselves with the complexity sciences.
- This is part of what we call the social science turn in complexity.

Castellani, Brian and Gerrits, Lasse. Forthcoming 2024. The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution



CHARTING NEW TERRITORY



THEME 2: COGNITION, EMOTION AND CONSCIOUSNESS

CH05: Theme 2 Introduction
CH06: Autopoiesis and Cellular Cognition
CH07: Bacteria and the Brain
CH08: Immune System Cognition
CH09: Brain-Based Cognition
CH10: Social Self
CH11: Human-Machine

THEME 3: DYNAMICS OF HUMAN PSYCHOLOGY

CH12: Theme 3 Introduction
CH13: Human Psychology as Dynamical System
CH14: Psychopathology of Mental Disorders
CH15: Healing and the Therapeutic Process
CH16: Mindfulness, Imagination and Creativity

THEME 4: LIVING IN SOCIAL SYSTEMS

CH17: Theme 4 Introduction
CH18: Complex Social Psychology
CH19: Sociology of Collective Behaviour
CH20: Critical Configurational Complexity
CH21: The Local and the Global: Complexiies of Place
CH22: Socio-Technical Life
CH23: Resilience and all that Jazz
CH24: Governance, Politics and Technocracy
CH25: Complex Economics

THEME 2: COGNITION, EMOTION AND CONSCIOUSNESS

CH06: Autopoiesis and Cellular Cognition
CH07: Bacteria and the Brain
CH08: Immune System Cognition
CH09: Brain-Based Cognition
CH10: Social Self
CH11: Human-Machine

Castellani, Brian and Gerrits, Loose. Forthcoming 2024.
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution

Naturwissenschaften (2003) 90:49–59
DOI 10.1007/s00114-002-0389-9

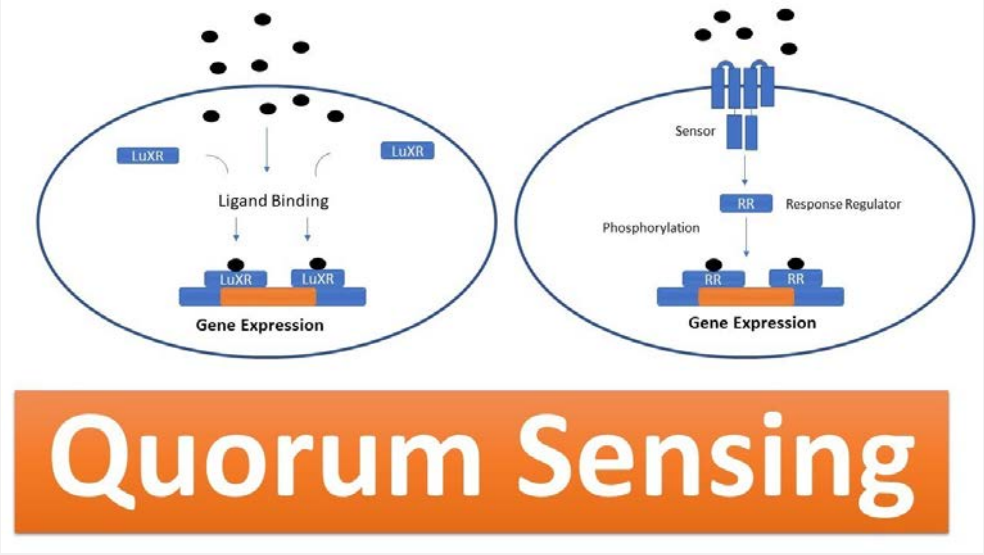
REVIEW ARTICLE

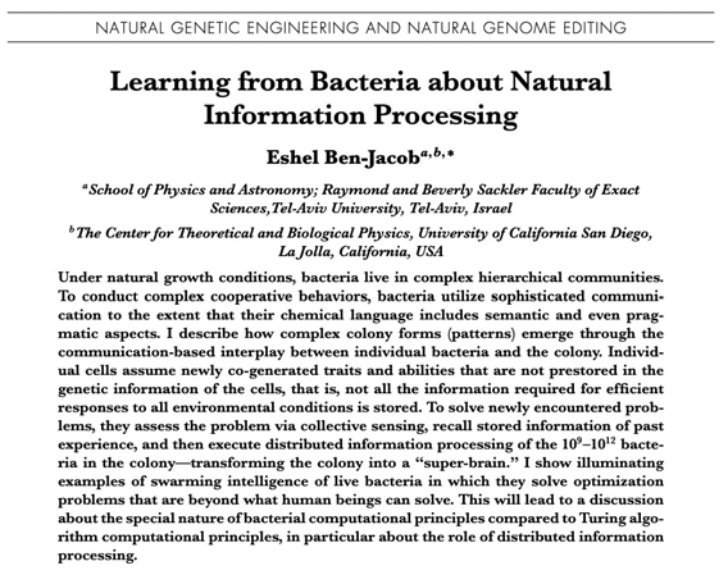
Pier Luigi Luisi

Autopoiesis: a review and a reappraisal

ing 2024.
ar.
ribution

From simple cells and bacteria to plants and insects to mammals and humans, cognition appears to be central to life on planet earth.





NATURAL GENETIC ENGINEERING AND NATURAL GENOME EDITING

Learning from Bacteria about Natural Information Processing

Eshel Ben-Jacob[a,b,*]

[a]*School of Physics and Astronomy; Raymond and Beverly Sackler Faculty of Exact Sciences, Tel-Aviv University, Tel-Aviv, Israel*

[b]*The Center for Theoretical and Biological Physics, University of California San Diego, La Jolla, California, USA*

Under natural growth conditions, bacteria live in complex hierarchical communities. To conduct complex cooperative behaviors, bacteria utilize sophisticated communication to the extent that their chemical language includes semantic and even pragmatic aspects. I describe how complex colony forms (patterns) emerge through the communication-based interplay between individual bacteria and the colony. Individual cells assume newly co-generated traits and abilities that are not prestored in the genetic information of the cells, that is, not all the information required for efficient responses to all environmental conditions is stored. To solve newly encountered problems, they assess the problem via collective sensing, recall stored information of past experience, and then execute distributed information processing of the 10^9–10^{12} bacteria in the colony—transforming the colony into a "super-brain." I show illuminating examples of swarming intelligence of live bacteria in which they solve optimization problems that are beyond what human beings can solve. This will lead to a discussion about the special nature of bacterial computational principles compared to Turing algorithm computational principles, in particular about the role of distributed information processing.

Autopoiesis and cellular cognition are heavily theoretical and in need for evidence.

Research on bacterial cognition and social behaviours is generating that empirical evidence.

Provides evidence for cellular cognition.

Also leads to new ways of thinking about what constitutes a brain

Shows how lower levels of cognition self-organise, from an evolutionary perspective, to form lager and more complex cognitive systems.

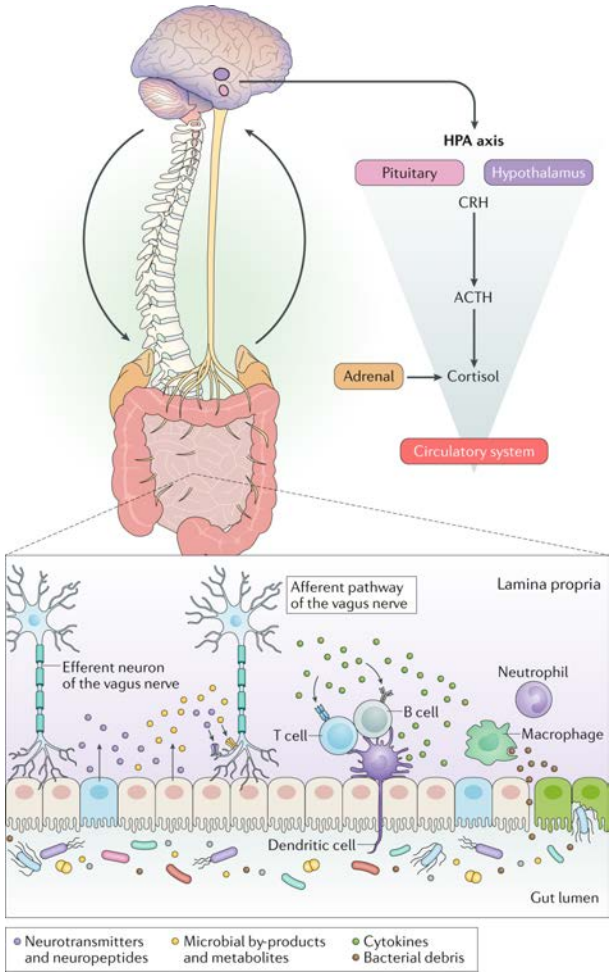
frontiers in
PHYSIOLOGY

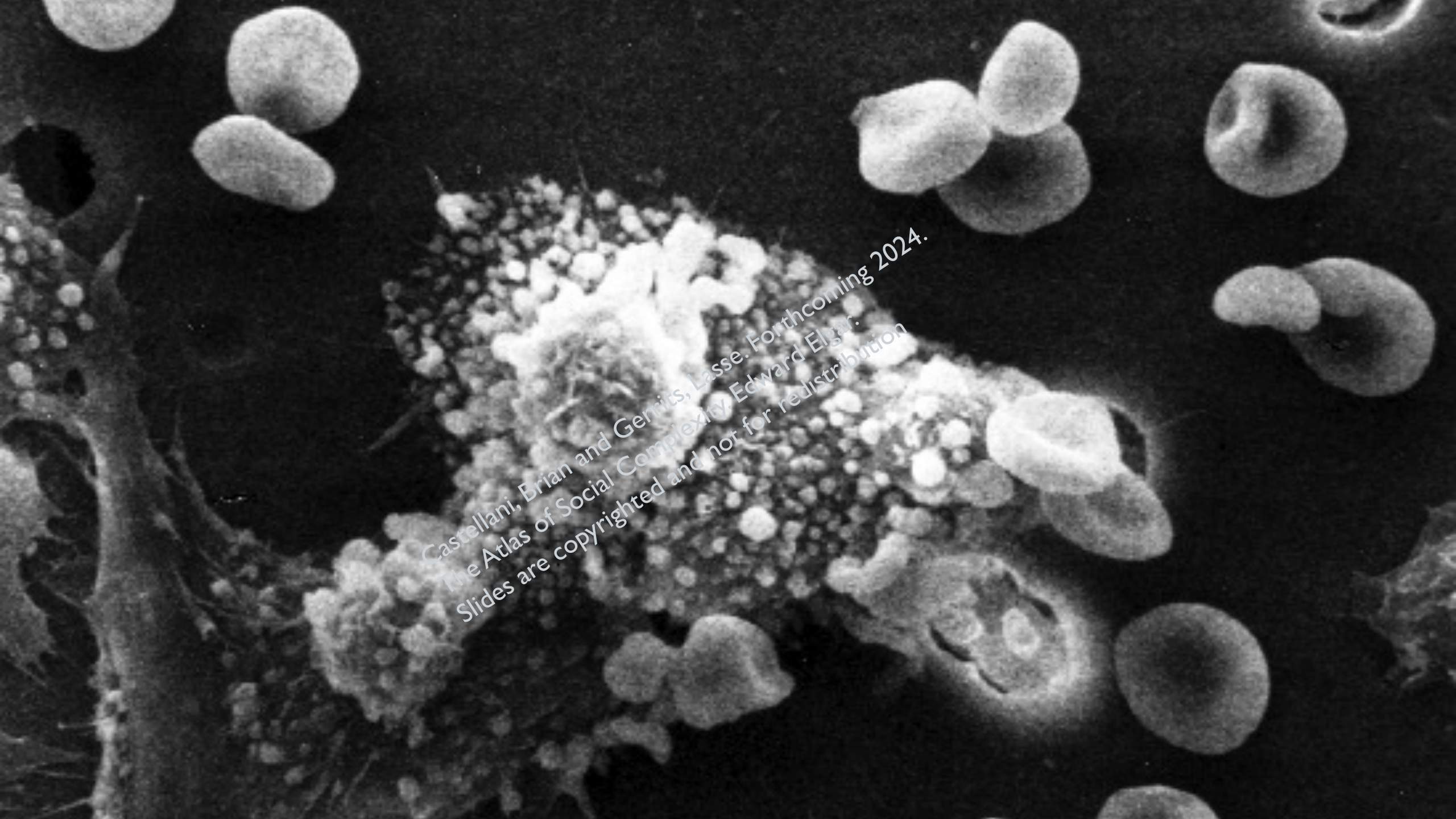
REVIEW ARTICLE
published: 07 December 2011
doi: 10.3389/fphys.2011.00094

Brain–gut–microbe communication in health and disease

Sue Grenham[1], Gerard Clarke[1,2], John F. Cryan[1,3] and Timothy G. Dinan[1,2]*

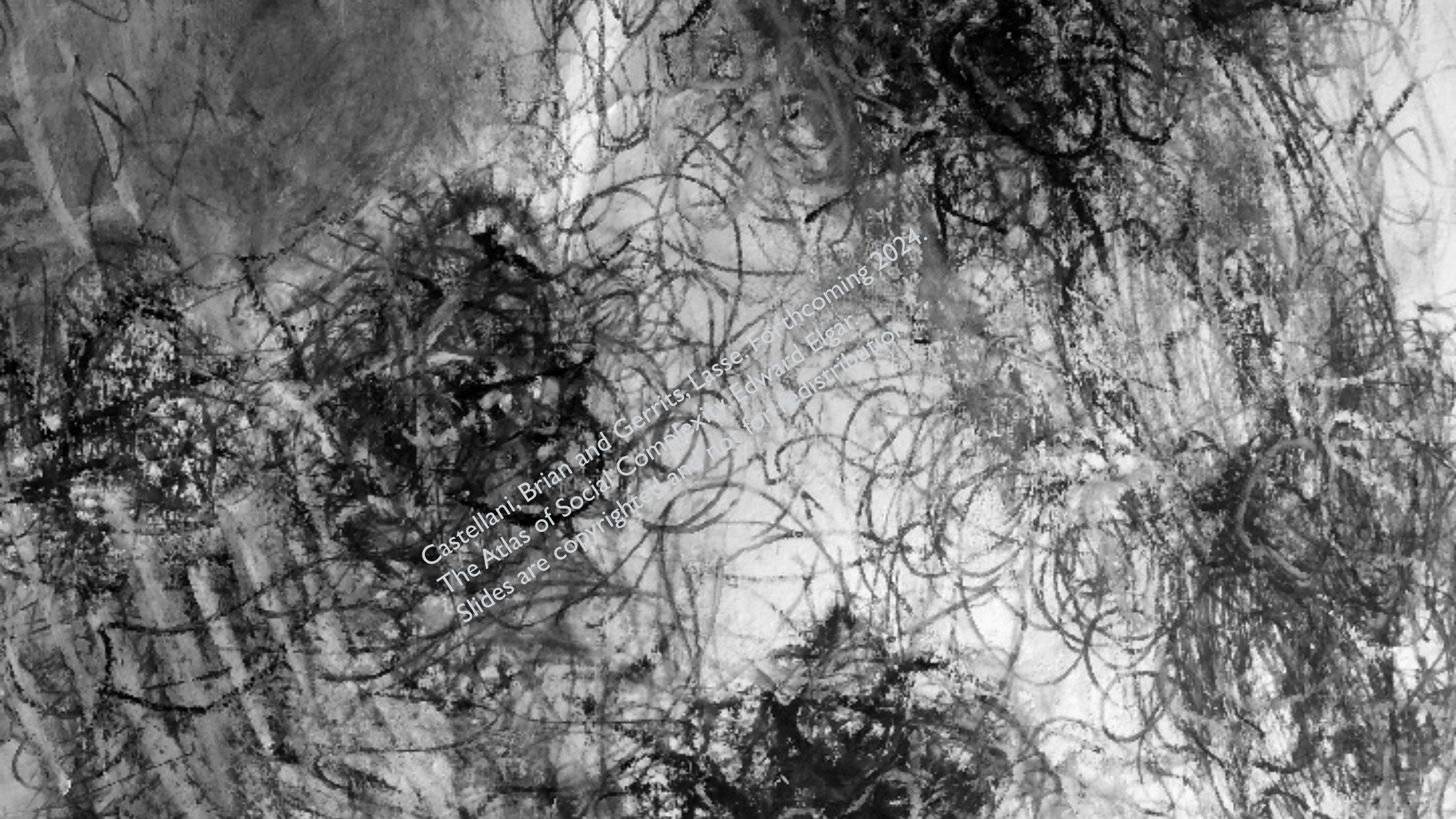
[1] *Laboratory of NeuroGastroenterology, Alimentary Pharmabiotic Centre, University College Cork, Cork, Ireland*
[2] *Department of Psychiatry, University College Cork, Cork, Ireland*
[3] *Department of Anatomy, University College Cork, Cork, Ireland*





Castellani, Brian and Gerrits, Lasse. Forthcoming 2024.
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution

- The founding principal of immunology is the concept of ‘identity’ and the capacity of immune systems to distinguish between self and non-self.
- Immunity is necessarily a cognitive act and immune systems are broadly cognitive systems.
- Eco-immunology is fundamentally reshaping our understanding of the immune system’s complex relationship with its environment and how this relationship can be harnessed to treat disease and infection more effectively.
-


Castellani, Brian and Gerrits, Lasse. Forthcoming 2024.
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution.

TO EXPLORE BRAIN- BASED COGNITION, we use a social complexity framework to sort our position relative to six major debates within the field:

(1) cognition and life,

(2) the mind/brain dualism

(3) the unconscious,

(4) Modularity

(5) emotions

(6) brain-based consciousness.

Castellani, Brian and Gerrits, Lasse. Forthcoming 202
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistributio

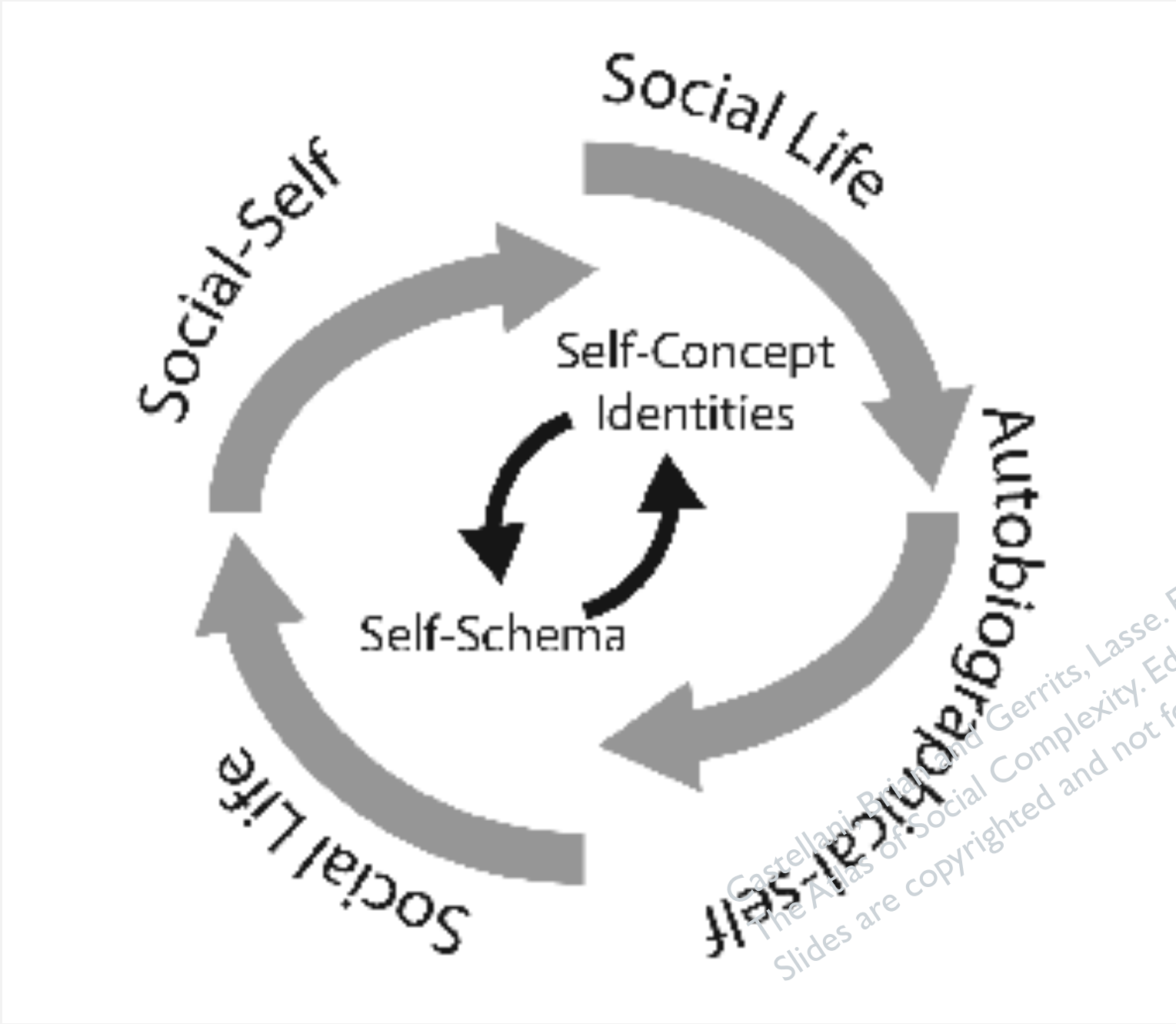
For the first three debates, we use systems thinking and some of its key concepts (namely, structure, organisation and process) to wiggle free of them, hopefully for good.

For the unconscious it means offering a peaceful conceptual divorce that lets both sides go their separate ways.

For emotions, it means redefining brain-based cognition in terms of our paleomammalian past to resolve the Spock Myth that somehow emotions are separate from logic.

With these issues sorted, we move on to outline the beginnings of a new complex systems theory of consciousness,

Castellani, Brian and Gerrits, Lasse. Forthcoming 202
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution



Castellani, Brian and Gerrits, Lasse. Forthcoming 2024.
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution

The Self exists as much for the body as it does for the agency of the self-reflecting mind.

The Self is part of our multi-level, embodied, complex system of consciousness, which can also extend outward to the wider consciousness of the various social groups of which we are a member.

The self also exists for others in our social worlds, including our outward facing *public-self*.

The *embodied-primordial-reflexive* self, if allowed to develop during the lifetime of an individual, and mainly through language acquisition and socialisation, can mature into more complex forms of self, including a higher-level *autobiographical-self* and a *social-self*.

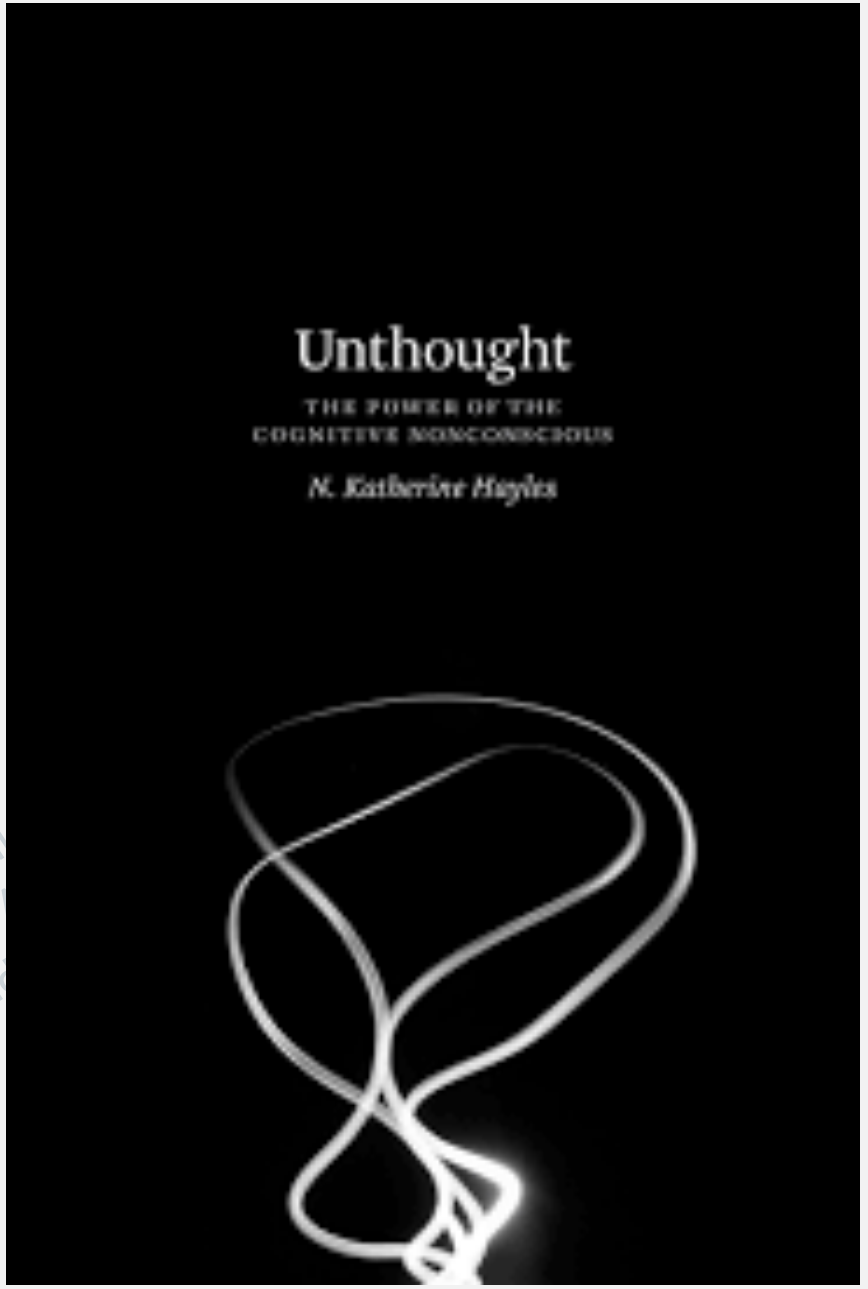
In this way, social groups, socialization, and social context are some of the most powerful evolutionary forces in the development of consciousness for humans and other social animals.

We cannot stress this point enough.

Social Complexity: Edward Elgar.
copyrighted material not for redistribution

HUMAN MACHINE

Castellani, Brian and Gerrits, Lasse. Forthcoming 2024.
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution


Unthought
THE POWER OF THE COGNITIVE NONCONSCIOUS
N. Katherine Hayles

THEME 2: COGNITION, EMOTION AND CONSCIOUSNESS

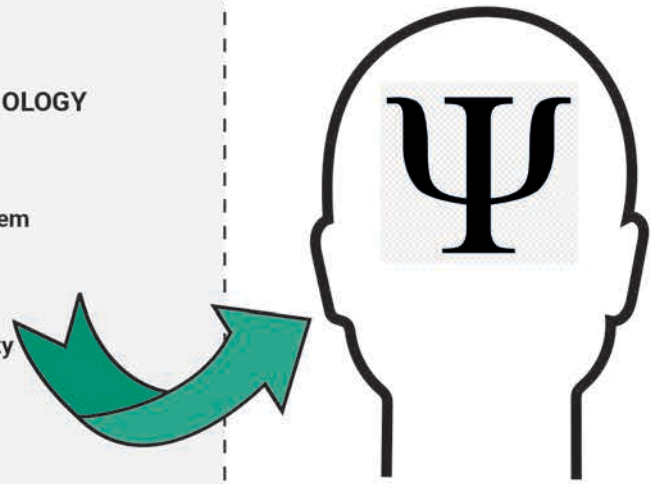
CH05: Theme 2 Introduction
CH06: Autopoiesis and Cellular Cognition
CH07: Bacteria and the Brain
CH08: Immune System Cognition
CH09: Brain-Based Cognition
CH10: The Self
CH11: Human-Machine

THEME 3: DYNAMICS OF HUMAN PSYCHOLOGY

CH12: Theme 3 Introduction
CH13: Human Psychology as Dynamical System
CH14: Psychopathology of Mental Disorders
CH15: Healing and the Therapeutic Process
CH16: Mindfulness, Imagination and Creativity

THEME 4: LIVING IN SOCIAL SYSTEMS

CH17: Theme 4 Introduction
CH18: Complex Social Psychology
CH19: Sociology of Collective Behaviour
CH20: Critical Configurational Complexity
CH21: The Local and the Global: Complexiies of Place
CH22: Socio-Technical Life
CH23: Resilience and all that Jazz
CH24: Governance, Politics and Technocracy
CH25: Complex Economics



THEME 3: DYNAMICS OF HUMAN PSYCHOLOGY

CH12: Theme 3 Introduction
CH13: Human Psychology as Dynamical System
CH14: Psychopathology of Mental Disorders
CH15: Healing and the Therapeutic Process
CH16: Mindfulness, Imagination and Creativity

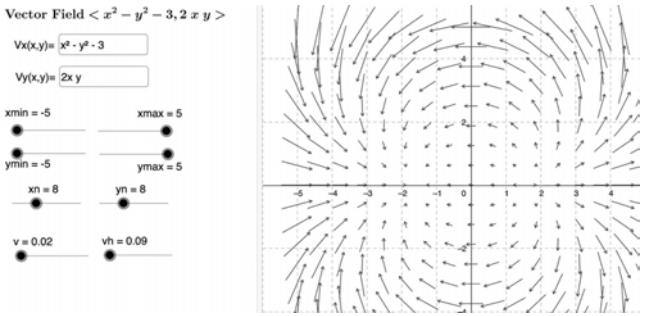
Castellani, Brian and Gerrits, Lasse. Forthcoming 2024. The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution.

aps ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

The Intrinsic Dynamics of Psychological Process

Robin R. Vallacher[1], Paul Van Geert[2], and Andrzej Nowak[3,4]
[1]Florida Atlantic University; [2]University of Groningen; [3]Warsaw University; and [4]Florida Atlantic University

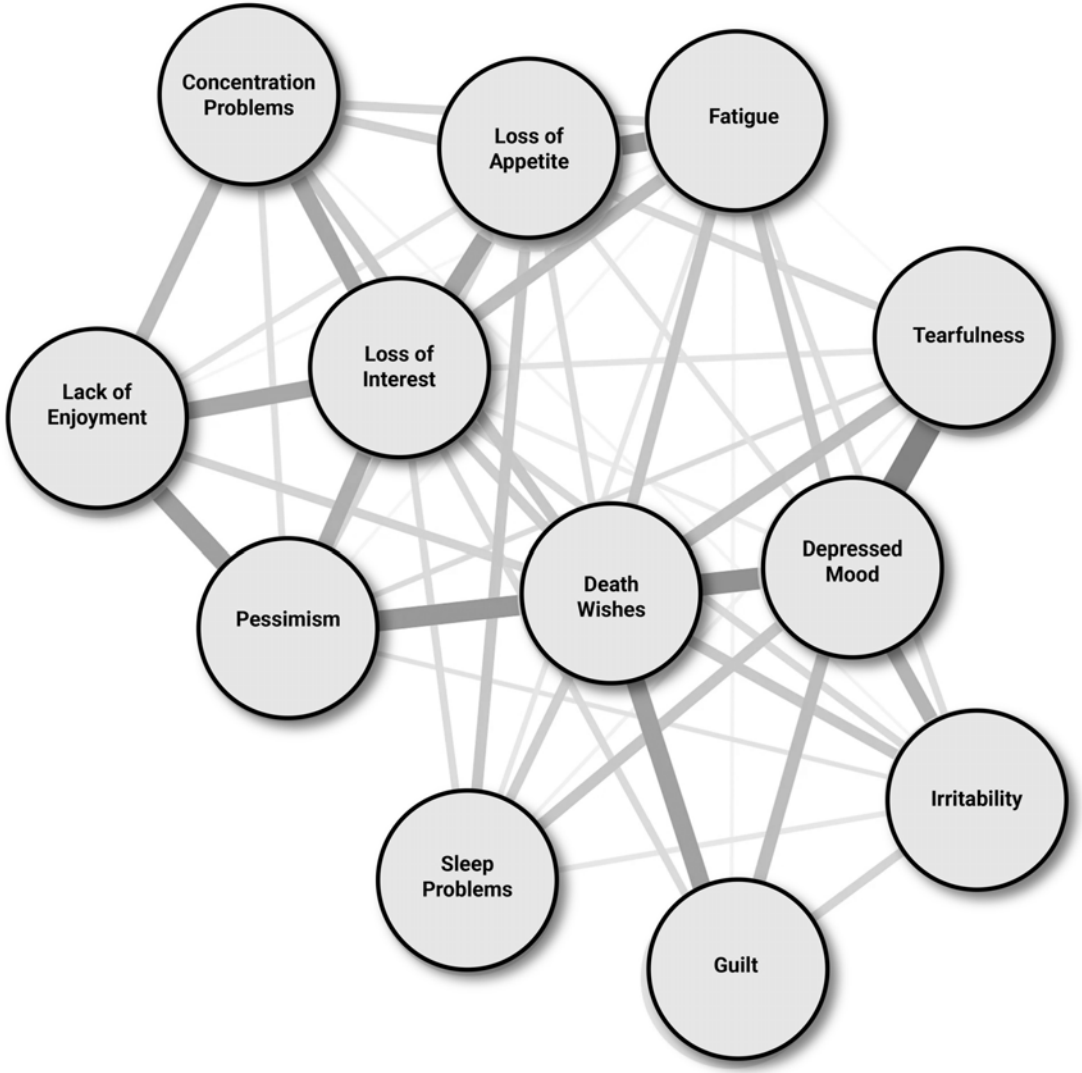
Current Directions in Psychological Science
2015, Vol. 24(1) 58–64
© The Author(s) 2014
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0963721414551571
cdps.sagepub.com
SAGE



Network Analysis: An Integrative Approach to the Structure of Psychopathology

Denny Borsboom and Angélique O.J. Cramer

Department of Psychology, University of Amsterdam, Amsterdam 1018 XA, The Netherlands; email: D.Borsboom@uva.nl



Self-organization, human resilience and psychotherapy

David Pincus

Chapter | First Online: 28 March 2020

3302 Accesses

Zusammenfassung

This chapter applies self-organization theory to human resilience and psychotherapy. Three broad classes of modeling are described: network modeling, topological approaches, and time-series analysis. Unique aspects and common features of each model is discussed, and empirical literature is reviewed, with a focus on how these various models contributes to a common theory of biopsychosocial resilience.

Psychotherapy Research

Routledge
Taylor & Francis Group

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/tpsr20

Causation and chance: Detection of deterministic and stochastic ingredients in psychotherapy processes

Wolfgang Tschacher & Hermann Haken

Mindfulness, imagination, and creativity

- The human brain is a portal between the physical world and mental life.
- With the brain (as its own form of structure and organisation) acting as a bridge, the two domains, the physical and the mental, are not separate but deeply intertwined, such that life and reality regularly relent to the powers of imagination and creativity, meanwhile the mind is entirely embodied, including the metaphors by which we live.

n and Gerrit Lasse, Forthcoming 2024
Social Complexity. Edward Elgar.
copyrighted and not for redistribute

Living in Social Systems

Castellani, Brian and Gerrits, Lasse. Forthcoming 2024.
The Atlas of Social Complexity. Edward Elgar.
Slides are copyrighted and not for redistribution

THEME 2: COGNITION, EMOTION AND CONSCIOUSNESS

CH05: Theme 2 Introduction
CH06: Autopoiesis and Cellular Cognition
CH07: Bacteria and the Brain
CH08: Immune System Cognition
CH09: Brain-Based Cognition
CH10: The Self
CH11: Human-Machine

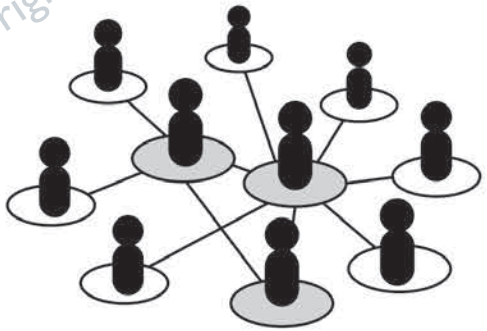
THEME 3: DYNAMICS OF HUMAN PSYCHOLOGY

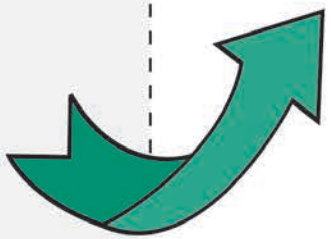
CH12: Theme 3 Introduction
CH13: Human Psychology as Dynamical System
CH14: Psychopathology of Mental Disorders
CH15: Healing and the Therapeutic Process
CH16: Mindfulness, Imagination and Creativity

THEME 4: LIVING IN SOCIAL SYSTEMS

CH17: Theme 4 Introduction
CH18: Complex Social Psychology
CH19: Sociology of Collective Behaviour
CH20: Critical Configurational Complexity
CH21: The Local and the Global: Complexiies of Place
CH22: Socio-Technical Life
CH23: Resilience and all that Jazz
CH24: Governance, Politics and Technocracy
CH25: Complex Economics

Castellani, Brian and Gerrits, Lasse. Forthcoming 2024. The Atlas of Social Complexity. Edward Elgar. Slides are copyrighted and not for redistribution





THEME 4: LIVING IN SOCIAL SYSTEMS

CH17: Theme 4 Introduction
CH18: Complex Social Psychology
CH19: Sociology of Collective Behaviour
CH20: Critical Configurational Complexity
CH21: The Local and the Global: Complexiies of Place
CH22: Socio-Technical Life
CH23: Resilience and all that Jazz
CH24: Governance, Politics and Technocracy
CH25: Complex Economics

- Social psychology plays a crucial role as the theoretical and empirical link between the dynamics of human psychology and the macroscopic patterns of social systems.

- As we will explore in this chapter, such distinctions have played themselves out within the complexity sciences and the study of social complexity. The first, which we have yet to introduce, is between a

- psychological versus sociological approach to social psychology.

- the application of complexity science topics to the study of social psychology versus the usage of social psychology to understand life in complex social systems.

- Synchronization.