
ESRC 3rd Research Seminar

Complexity: a Framework for Policy and Decision

*Support: Research, Adaptation & Learning in Social
Systems*

@ Cranfield Business School, 10 June 2009

Prof. Eve Mitleton-Kelly

Director

Complexity Research Programme

LSE

www.lse.ac.uk/complexity

ESRC Research Seminars Competition 2007/8

6 Co-Applicants

- Prof. **Eve Mitleton-Kelly**, Director, Complexity Research Programme, LSE (Principal Organiser)
 - Prof. **Brian Salter**, Professor of Politics of Biomedicine, Centre for Biomedicine and Society, King's College London
 - Prof. **Jeff Johnson**, Professor of Complexity Science and Design, Open University
 - Prof. **Peter Allen**, Professor of Evolutionary Complex Systems, Cranfield
 - Prof. **Robert Geyer**, Professor of Politics, Complexity and Policy, Lancaster University
 - **Alex Paraskevas**, Senior Lecturer, Oxford Brookes
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Applied Complexity Theory as the New Framework for Management and Public Policy

Sem. 1 with KCL at LSE ‘*The Global Governance of New Health Technologies*’ – 26 November 2008

Sem. 2 with OU at LSE: ‘*Energy Policy & Climate Change: the Contribution of Complexity Science*’ – 24 March 2009

Sem. 3 at Cranfield: ‘*Modelling of Policy Decisions*’ – 10 June 2009

Sem. 4 at Lancaster: ‘*Complexity and the International Arena*’ - **6 Nov 2009** + papers to be published in special issue of ***Cambridge Review of International Affairs*** in June 2010

Sem. 5 at Oxford Brookes ‘*Terrorism and the Complexity of Soft Targets: The Case of the Tourism Industry*’ - Feb/Mar 2010

Sem. 6 at LSE ‘*Complexity as a Framework for Public Policy*’ - June/July 2010

Objectives

- Identify the grand challenges that could be addressed by complexity science &
 - Develop ideas for multi-disciplinary research project proposals
 - Seminars only a starting point for networking & sharing of ideas
 - Other days will be organised to focus on the ideas and the projects
 - Publish papers on seminar topic by speakers & participants
 - e.g. LSE Working Paper Series on ESRC Seminar topics
 - 5,000 words, peer reviewed and published as journal articles both on line and in print with ISSN registry
 - email your papers to: complexitygroup@lse.ac.uk
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Dedicated Research Seminar Pages

- Embedded videos of presentations and discussions
- Multiple download formats plus video DVD
- Raising user engagement and outreach to wider academic and non-academic audiences
- Enhanced dissemination



www.psych.lse.ac.uk/complexity/ESRCComplexitySem2Ses1

Virtual Networking through Second Life



[www.psych.lse.ac.uk/complexity/
ESRC ComplexitySem2SL](http://www.psych.lse.ac.uk/complexity/ESRC_ComplexitySem2SL)

- Live broadcast of research seminars
- 3D web technologies for audience engagement
- New virtual research environment
- Creating a new platform for collaboration between natural and social scientists
- Linked with the current ESRC Complexity Seminar Series

LSE Complexity Twitter Site & Blog Page

TWITTER

- Intensify exchange of information
- Share links to current research papers
- Circulate announcement of new research funding calls

<http://twitter.com/lsecomplexity>

BLOG

- Enable users to comment on website content: videos
- Socially network with other research groups
- Encourage junior researchers to express views
- Bring interdisciplinary groups closer

<http://lsecomplexity.wordpress.com/>

*Complexity: a Framework for Policy and
Decision Support: Research, Adaptation &
Learning in Social Systems*

Challenges

Challenges to modelling

- Capturing the qualitative aspects of policy
 - Adaptation to changing user requirements
 - Behavioural & economic preferences with tipping points based on different drivers
 - Modelling adaptive capacity
 - Representing multiple stakeholders
 - Model results may be a selection of fairly diverse scenarios that are all considered as possibilities
 - Scoping: identifying the range of impacts that a policy is likely to have
 - Quantifying the likely impact of policy change
 - Scale in policy modelling: from local to national & global; & combining scales in multi-scale modelling
 - Focusing on multiple, related processes
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Challenges

- **Temporal issues** – e.g. non-linearity may mean that policy decisions have short-term benefits and longer-term problems, or vice versa
 - The **design & implementation of a multi-perspective** knowledge representation framework, incorporating **quantitative and qualitative information** from different sources characterised by variations in **reliability and imprecision**
 - **Multiple stakeholders** and therefore **uncoordinated approach**
 - **Agile targets vs agencies working in silos**
 - Difficulty in **assessing the performance of outcomes**
 - Understanding the practical advantages of using decision support tools and their applications in different areas within the organisation would not only strengthen the analytical background of our work, but would also underline the value of information by allowing a **transparent attitude towards uncertainty in decision making**
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Wish we could ...

- Introduce *uncertainty & emergence* into rationalist thinking
 - Take a multidimensional view of the environment (conjecture the emergent objects, integrations and relationships with existing elements of the system) and then model *a dynamic and co-evolutionary environment*
 - Develop more *user friendly modelling tools*
 - Enhance and develop better and more *user friendly visualization tools*
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Constraints & Barriers

- Lack of understanding of the potential and applications of Complexity by senior officials in government
 - Deeply entrenched reliance on 'traditional' methods of modelling and analysis by modellers and economists
 - Lack of external access to data, the methodology and the functionality of 'traditional' models
 - Relationship between engaged stakeholders & modellers (preventing disengagement)
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The Contribution of Complexity

- Systematically *compare policy outcomes* based on prevailing policy making paradigms with those that would obtain if they were based on a complexity paradigm
 - *To highlight what a complexity perspective might “buy us” in terms of policy benefits*
 - e.g. macro-economics, security and intelligence, immigration, urban planning, education
 - **Case-based** (could be modelled on Graham Allison’s 1971 study of the Cuba missile crisis of 1962) - methodology could be transposed from one research area to another
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*Cambridge Centre for Energy Studies,
University of Cambridge*

- Utilising local climate data to predict future climatic changes to inform policy makers of necessary *policies for adaptation*;
 - Looking at the implications of adaptation to climate change through *co-evolutionary dynamics* (in conjunction with LSE);
 - Analysis and modelling of *vulnerabilities in social systems* when exposed to multiple stressors, e.g., abrupt environmental change;
 - Identifying appropriate *policy interventions at unstable interfaces* between complex systems which exhibit significant internal instability and are exposed to multiple environmental changes;
 - Analysis and modelling of *policy risk and resilience* for energy security and environmental change.
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Economics

- The challenge is to put *spatial structure into economic theory* by taking households and establishments as the transacting entities
- What evolve are 'eco-structures' (towns and cities) that have relative hierarchical stability over the longer term

The challenges include:

1) Modelling the *emergent properties* of the system to provide macro-laws for the evolutionary trajectory

2) An evolutionary model with *alternative scenarios* for 2100 and 2150 generates lower rates of growth in Gross World Product than the scenarios of the Intergovernmental Panel on Climate Change, which will impact upon global energy use and carbon dioxide emission levels.

3) Investment capital is the system growth parameter, and the course of world development can be changed by *critical intervention* points in the global macro-systems

Economics

- *The challenge is to establish the **effects & likely outcomes of any proposed interventions**, and to identify those that will create a cost-effective and beneficial change to the system*

 - How will the existence of *productive nanosystems*, which overturns traditional economic concepts such as “supply” and “demand”, affect national policy and planning?
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Local Government

- Incentives to **break down Professional Boundaries**. We see this in the combination of Social Care and Education professionals in Children's Trusts, but are aware that **we are not meeting the needs of vulnerable children**. Children and adults with disabilities are also subject to many assessments in order to access services because of the **different models used by professionals to understand needs**.
 - **Integration within and across organisations, to support more organic collaboration and learning and development**. This would need to address the current systems of rewarding and motivating people, and supporting a workforce that could take managed risks.
 - **How to engage people in decision making where there are no obvious representative stakeholders**, and yet the perception is that we need a macro policy response rather than a very locally based response (which could be designed by communities).
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Crime Prevention

- **Crime prevention** is complex, yet practitioners have little training and are currently guided by simplistic causal models such as the 'crime triangle' and process models which amount to one-line slogans
 - *In a world where we value democracy and public participation, and social and environmental problems are complex, how can we develop ways to communicate that necessary complexity, in ways which do justice to the issues, but which can be understood and applied by politicians, public and practitioners?*
 - **Design of** products, places, procedures and **systems against crime** necessitates a well-structured and detailed framework with key concepts clearly defined; yet designers emphasise creativity and innovativeness.
 - *How can we reconcile designers' requirement for freedom to be creative with the need to apply a rigorous and disciplined scientific framework? This is of particular importance in the interface between design and the STEM (Science, Technology, Engineering and Maths) disciplines, which problem-solving and wealth creation increasingly demands.*
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Process

- Network
 - Put your name down for small group discussion in one area + register your interest in other areas
 - Add more challenges during the day
 - If you would like to lead the discussion on one topic, then say so
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Thank you

E.Mitleton-Kelly@lse.ac.uk

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