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Complexity, systems thinking and evaluation – an emerging relationship?

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“How is it that ideas that variously sail under the flag of ‘complexity’ – or ‘holism’, ‘non-linearity’, ‘systems theory’ and ‘cybernetics’ – have come to the fore? Implicit in this question is the acknowledgement that in the wider world of ideas, complexity as a focus is not that new”

*(Elliot Stern, Foreword, ‘Evaluating the Complex’)*¹ Thanks to Elliot Stern who commented on earlier drafts of this article

Starting point

‘Complexity’, ‘systems thinking’, ‘evaluation’ are all *good* words with positive connotations. At the 2012 EES Helsinki Conference a panel discussion explored the relationship between these concepts. This article sums up the discussion, and outlines an agenda for further research and debate.

A recent publication proposed a framework for evaluating complex policies and complex situations¹ grounded in the interaction of four elements – simplicity, inventiveness, flexibility, and specificity. In a foreword, Elliott Stern commented on the legacy of a systems approach based on the work of influential thinkers (Ludwig von Bertalanffy, James Miller, Fred Emery, Eric Trist, Stafford Beer, Russ Ackoff and Peter Checkland) who challenged prior reductionist, linear approaches some four decades ago.

Why despite their cogent challenges do such approaches still pervade contemporary management science and evaluation practices? What other expressions of systems thinking may assist methodological development in evaluating complex interventions?

¹ Kim Forss, Mita Marra and Robert Schwartz Ed., *Evaluating the complex: attribution, contribution and beyond* (Volume 18; ‘Comparative Policy Evaluation’ series, Transaction Publishers, 2011)

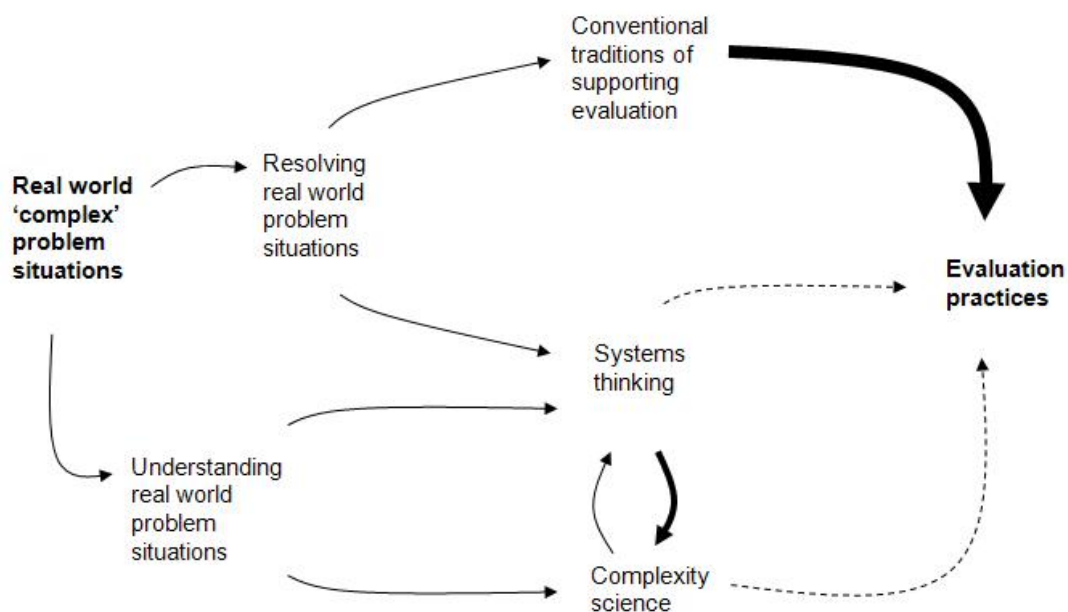
Definitions

We normatively claim that *evaluation* involves *systemically exploring* the worth, the merit and the value of an object or intervention, acknowledging that such judgements are subject to change during the intervention and the evaluation.

Complexity as commonly understood is shorthand for everything that is messy, difficult to grasp, not easily understood, etc. Complexity deals with complicatedness of interconnections amongst entities. 'Complexity science' deals with phenomena where inter connections between elements are non-linear and the emergent properties from interconnections are subject to uncertainty. Complexity can also be as a function of different perspectives on the complicatedness of situations.

Systems thinking originates from three traditions – the philosophic pursuit of 'getting the bigger picture' (holistic thinking), the practical pursuit of engaging with multiple perspectives each circumscribed with bounded judgements (pluralistic thinking and participatory practice), and the purposeful pursuit of improving situations (operational research and action research).

How do these relate to each other? The influence diagram below seeks to show how these different paths of thinking relate to each other (thickness of lines signal relative perceived strengths of existing influences)



Paths of convergence

“Not all models are good and useful, but there is nothing as concrete and practical as a good model when evaluating complex policies” (Forss and Schwartz¹)

Complexity science and systems thinking share a mutual concern for:

- Challenging narrow-minded reductionist practices, ‘rational’ models of policy-making, linearly assumed causal relationships and experimental evaluation designs which can often inhibit more appropriate or meaningful evaluation.
- Encouraging a dynamic, more holistic - whilst situated - perspective which influences the ability of evaluators to manage deliberative processes about complex problems in a democratic fashion.
- Promoting pluralism and inclusivity in the sense of (i) incorporating contrasting perspectives echoing fourth-generation approach and empowerment approaches to evaluation and (ii) maximising the use of multiple methods.
- Highlighting the need to address emergence and systems change, drawing upon generative causality open to improvisation and unpredictable outcomes.
- Stressing co-evolution for evaluation practice and for practices being evaluated thereby identifying key issues in the changing landscape and shifting actors’ attention to new issues as they arise.
- Emphasizing the value question and seeking answers to what constitutes ‘worth and merit’ in the project, programme or policy being studied/evaluated.
- Elevating concern with processes; particularly those facilitating meaningful conversation, as in participatory evaluation.
- Drawing upon the theme of conversation as ‘evaluation with action’ while seeking to create “collective intelligence” and innovative interactions.
- Emphasising constructivist perspectives that recognize that evaluation is shaped through practice and through the interaction between organizational/institutional members and processes.
- Being mindful of interrelationships and purpose in conceiving networks as unit of analysis, thus implying a method of inquiry that involves interpretive reframing geared to serving the common good.

- Balancing the “safety” of exploiting well-accepted meanings associated with consolidated practices with the “dangers” of exploring radical interpretations and unfamiliar perspectives.
- Distributing and generating new information and novel action in contrast to the ‘performance management’ and ‘quality’ movements that are preoccupied with controlling deviance.
- Embracing *praxis* – the continual reflection on theories-in-use as against a singular focus on espoused theory – and the learning acquired through the practical application of conceptual tools.
- Applying three generic concepts common to all areas of the systems and complexity field: (i) exploring interrelationships, (ii) engaging with multiple perspectives, and (iii) reflecting on boundary judgements.

Paths of divergence

*“The complexity resides in the evaluated object and how the evaluation handles that process is a step toward understanding, recognising, and making sense out of the complexity “out there””
(Forss and Schwartz¹)*

- The complexity perspective sees the world as structured, differentiated, and changing. It is structured in layers, from observable and physical features that can be mapped, to increasingly abstract layers of structures and mechanisms. Public policies and programs can be mapped and observed at a physical level and measured but only explained and understood at levels where hidden social, political, and economic structures are uncovered and analysed. In the *hard* systems tradition of thinking about systems, the emphasis is placed on the importance of complexity science in revealing the interconnectedness of entities being evaluated. In contrast, contemporary *soft* and *critical* systems thinking approaches regard complexity more as a function of the observer (2nd order cybernetics) rather than the observed (tradition of 1st order cybernetics).
- The assumption that interventions (projects, programmes, policies) exist as real world systems with independent purposes emphasises systems as purposive systems. The basic task here is to reveal the interconnected workings of such systems in order to ascertain whether the system “works”. Contemporary systems thinking regards systems not as actual real world entities but rather as conceptual devices in order to learn and transform reality. The shift here is from ‘purposive’ to ‘purposeful’ evaluation.

- Systems thinking evokes a literacy of craft skills rather than a bounded discipline. It encompasses a set of evolving abilities to understand and use symbols through language and diagramming for purposeful development. Ideas from complexity science/theory are only part of a wider set of craft skills associated with systems thinking.
- Systems craft skills and associated methods can be examined in relation to their relevance to evaluation questions. This is the route that evaluators should take in selecting and/or adapting appropriate methods. A question orientation encourages the use of multiple approaches, including systems methods - or even elements thereof - alongside 'traditional' methods.
- Methods associated with the systems field provide distinctive contributions to evaluation, e.g. models for dynamic inter-relationships (e.g. Causal Loop Diagrams, Stock Flow Diagrams, Agent Based modelling or Social Network Analysis) as well as methods for clarifying perspectives (e.g. Soft Systems Methodology) or those that work constructively with diverging opinions (e.g. Circular Dialogue, Contradiction Analysis) to improve understanding, achieve consensus or create new insights.
- A *critical* systems thinking tradition of concern for boundary judgements invites the notion of designing purposeful engagement but also supports an *explicitly* ethical and political engagement with evaluation. This also involves a critical analysis and reflection on the power issues that are often associated with boundaries, which determine what is relevant, legitimate or ignored.

Future pathways

- Treated as a literacy rather than a bounded discipline (as implied through complexity science), are there opportunities for using systems and its rich and evolving heritage of language as a conversation around evaluation issues? Considered this way, systems thinking is not confined to a particular niche ('systemic evaluation'). Instead, it is valid for and applicable with many other evaluation approaches.
- Systems thinking can help contribute towards a shift from 'attribution' (purposive systems) to 'contribution' (purposeful systems design) and 'beyond' (critical thinking on the ethics and politics of evaluation).
- Treating systems as heuristic (learning) devices means tapping opportunities for complementarity with other evaluation traditions – in particular, theories of change (including programme theory), developmental evaluation, and (critical) realist evaluation.

- Methods, in this view, are semi-structured, providing semi-coherent guides within which room for change is allowed as policy goals, instruments, and relevant indicators change in relation to the evolving features of the environment.
- Methods become mechanisms for coordinating actors and organizations/institutions in complex settings and communities. Evaluation tasks thus become more than things to be done but also opportunities to build constructive relationships for collaborative undertakings.
- Embellishing complexity approaches with a literacy framework associated with systems thinking in practice would build on (i) understanding interrelationships (being concrete and specific), (ii) engaging qualitatively with multiple perspectives (be flexible), and (iii) reflecting on boundary judgements (be inventive).

The use of evaluation relies on the connections across actors, when individuals interact and exchange findings, data, opinions, and suggestions for future action. Complexity science urges evaluators to detect and emphasize these enabling relationships and structures emerging between 'system' participants. Evaluation should then concentrate on understanding the capacities for interactions to promote improvement, as also evaluators establish both formal and informal communication, spaces for communication, and rewards for enhancing interaction. As interactions between participants are mostly voluntary, evaluators can create open architectures, forums, focus groups, or electronic work groups. The information and the knowledge thus generated are dynamic qualities that form the basis for improved future interactions and policy interventions.

These ideas although beginning to feature in evaluation thinking are still only partly understood and operationalised. Evaluators by and large do appreciate that increasingly complex situations associated with major public policy challenges (such as combatting poverty or addressing climate change) require approaches that recognize and take into account inherent complexities. Yet this message is for the most part not getting through to policymakers. Linear models (such as the logical framework) still dominate, which pretend that an intervention can work, and its impact can be assessed, without taking into account context and multiple interacting activities and variables. The same

applies to many applications of the so-called "gold standard" randomised controlled trial. There is still much too much naive faith that one can assess the value of a complex initiative – and reward, or punish, performance – with just a small number of quantitative indicators, despite considerable evidence to the contrary.

What is the solution to this dilemma? The panel debate at the EES conference implied that there is no simple answer to this. But it does seem apparent that evaluators cannot discuss these important concepts just amongst themselves. Evaluators need to make greater efforts to reach out to other constituencies, identifying and working together with influential allies, who can help create greater awareness and value of the insights from systems thinking and complexity science. As policies and programmes grapple with increasingly innovative policy instruments as well as increasingly sophisticated citizen demands for participation and accountability, systems and complexity concepts could well provide some of the vital responses that evaluators will need in the future.