

Using complexity theory in policy work

Mat Walton

School of Public Health
Massey University

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Outline

- Part One: What is (my) complexity theory?
- Part Two: Using complexity in policy work - examples
- Part Three: Research Findings:
 1. Opportunities and barriers for using complexity
 2. Two perspectives on complexity
 3. Programme governance

Marsden Fast Start Project

Interviews with Thematic analysis

41 Key Informant Interviews

Defining Complexity

Barriers to application

Opportunities for application

Methods

Implications for policy & evaluation practice

Case Studies

- Case Study 1
- Evaluation use

- Case Study 2
- Causal attribution

Q Methodology

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Dr Angelique Praat

Advisory Group:

Nan Wehipeihana

Prof Jackie Cumming

Dr Jenny Neale

Participants – 56

Part One

What is complexity theory?

Basic description

Complexity theory provides:

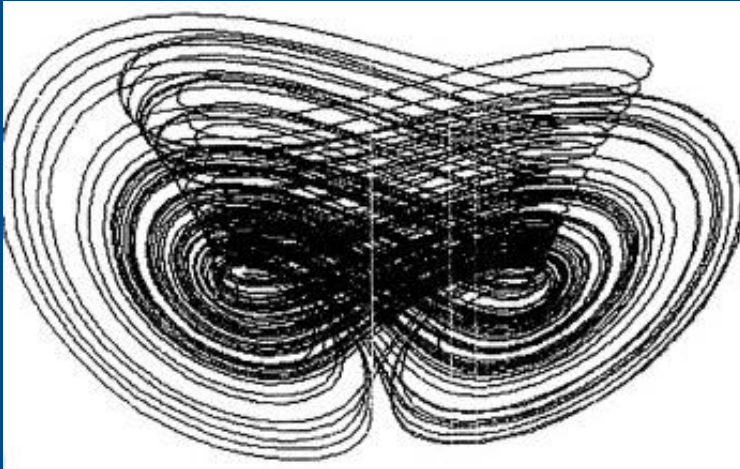
- An understanding of how systems change over time
- Guidance on policy research methodology
- Ideas on intervention design
- Guidance on evaluation methodology
- Particularly useful for ‘wicked’ problems?

Where to use complexity?

Wicked vs Tame Problems

'Wicked' Problem	'Tame' Problem
No definite formulation of problem	Well-defined and stable
Continually evolves	Know when a solution is reached
Solutions are better or worse	Solutions clearly right or wrong
Many causal levels	Causes are evident

Source: Blackman T, Greene A, Hunter DJ, et al. (2006) Performance Assessment and Wicked Problems: The Case of Health Inequalities. *Public Policy and Administration* 21: 66-80.



Complexity concepts

Complex systems:

- Are made up of multiple interacting agents
- Include other complex systems (nested systems)
- Are historically determined, exhibit patterns of behaviour
- Develop through non-linear interactions
- Develop 'emergent' properties

Complexity Theory

Restricted vs General Complexity

Restricted Complexity:

- The search for a few simple rules that govern self-organisation within a system
- Structure as micro-emergent, little causal power

General Complexity:

- Understanding the whole and parts of a system, and their interaction (mechanism-context configurations).
- Structure has power, so do agents.

Byrne D and Callaghan G. (2014) *Complexity Theory and the Social Sciences: The state of the art*, Oxon: Routledge.

Part Two

Examples of use in policy work

In Policy

How to achieve target of electric cars (Querini & Benetto. (2014) *Transportation Research Part A*. 70(1))

- Use of Agent-Based Model to test scenarios of achieving Luxembourg's aim of 40,000 electric cars by 2020.
- Requires sympathetic policies in Belgium and Germany
- Aided by widespread public charging points
- Identifies household characteristics most likely to respond to policy incentives

In Policy

To inform investment in smoking cessation services in NZ (Tobias, Cavana, Bloomfield. (2010). *American J. Public Health.* 100(7))

- Compared simulation of business-as-usual with enhanced service scenario on smoking rates over 50 yrs
- Enhanced services showed 11% greater decline
- Analysis led directly to increase in funding by \$42 million over 4 years

In Evaluation

Health Inequalities in England (Blackman et al 2011, Social Science and Medicine. 72(12))

- Use of Qualitative Comparative Analysis to identify factors associated with narrowing of inequalities in cancer and cardiovascular disease across local authority areas in England

Results from literature review

In Evaluation

Framing Considerations (less coherence in literature):

- Explicit use of complexity concepts (e.g. emergence)
- Defining appropriate level of analysis
- Timing of evaluation

Walton (2014) *Evaluation & Program Planning*. 45 p.119

Results from literature review

In Evaluation

Method considerations (more coherence in literature):

- Developing a view of the system over time
- Mixed methods
- Participatory methods
- Case study design

Walton (2014) *Evaluation & Program Planning*. 45 p.119

Policy Trends

Broad trends in policy work consistent with (but not limited to) complexity

- Understanding trajectory through systems
- Considering interactions between programmes and institutions
- Understanding what works, for whom and why
- Increased stakeholder engagement and participation

Part Three

Research Findings

Results

Results discussed:

1. Key informant interviews – use of complexity in policy and evaluation
2. Case study – Evaluation use
3. Q Methodology study – what is useful evidence and what do policymakers want?



Results

Key informant interviews

- 41 participants
- Mixture of policy and evaluation professionals and academics
- All had direct experience of applying systems thinking and/or complexity theory
- Most from NZ

Defining Complexity

Complex Interventions

- Complexity feature of intervention
- Narrower scope for applying complexity

Complex Systems

- Complexity feature of systems
- Wider scope for applying complexity

Barriers to Application

- Resource constraints
- Dominance of existing approaches
 - Views of “legitimate” evidence
 - Expectations of stakeholders
- Purpose of evaluation – accountability vs learning
- Limited practitioner knowledge of complexity
- Limits to current complexity methods and tools

Opportunities for Application

- **Organisational Environment**
 - Willingness to try new approaches, increasing focus on collaborative policy and programmes
 - Supportive managers
 - Budget surplus vs austerity
- **Political Environment**
 - Expectation for cross-agency action
 - Desire to show what worked despite complexity
- **Social Science Environment**
 - Growing expectation of mixed methods
 - 20 years of sympathetic evaluation methodologies

Case Study – Evaluation Use Fruit in Schools Programme

Complexity consistent evaluation

Findings

Biggest impact for agency x
Smaller impact for agency y

Findings:

Part A had good impacts with combined with part C in the context of coordinated action and external supports.

Context

Change of government

Decisions

Decisions all made by agency y

- Part A is effective
- Continue part A
- Discontinue part C
- Discontinue supports
- Stop tracking impacts

Walton (2016) Setting the context for using complexity theory in evaluation. *Evidence and Policy*. 12(1) pp. 73-89

Methods

Step 1

Exploring
experience of
using complexity
theory

41 Key
informant
interviews

Step 2

Themes
regarding use of
evaluation and
“good” evidence

Thematic
analysis

Step 3

Exploring
policymaker
understanding of
evaluation
evidence and
uses

Q Methodology

Q Methodology Study

Q Methodology ... helps quantify human subjectivity in a way that allows for statistical interpretation while leaving the scope for in-depth, qualitative interpretation.

Kamal et al. (2014) Quantifying Human Subjectivity Using Q Method: When quality meets quantity. *Qualitative Sociology*. 10(3): 60.

Defining Q Methodology

Q Methodology Relationship with Complexity Theory

- Based on abductive reasoning
- Starts from quite open boundaries of an issue and allows participants to construct boundaries and interactions from their perspective
- By ranking one statement compared to others, it begins to capture interaction
- Provides holistic understanding of perspectives

Q Methodology Study

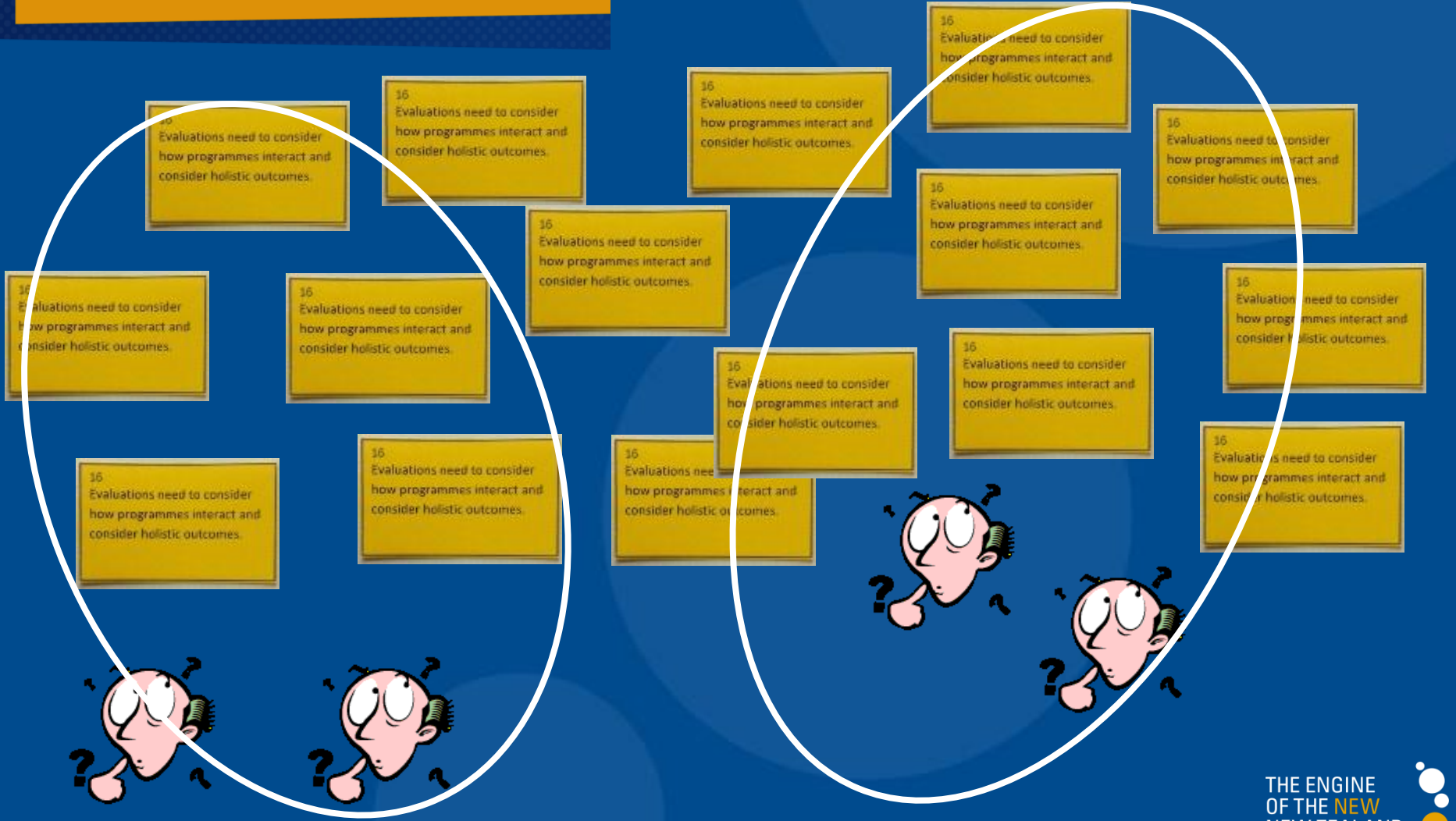
Theme from interviews		Theme summary – sources (references)	Q-sort Statements
What is valid evidence	Certainty vs uncertainty	4 (4)	In a complex system there is always uncertainty that the findings capture what is really going on.
			In communicating findings we need to reduce uncertainty so that findings are seen as credible.

Q Methodology Study

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Q Methodology Study



Q Methodology Study

- Concourse – defined by interview themes
- S sample – 35 statements
- P sample – 15 participants
 - From 8 government agencies – social, natural, economic areas
 - 4 were also key informant interview participants
 - 7 had experience in applying systems approaches
 - 10 primarily in evaluation roles, 5 in policy roles

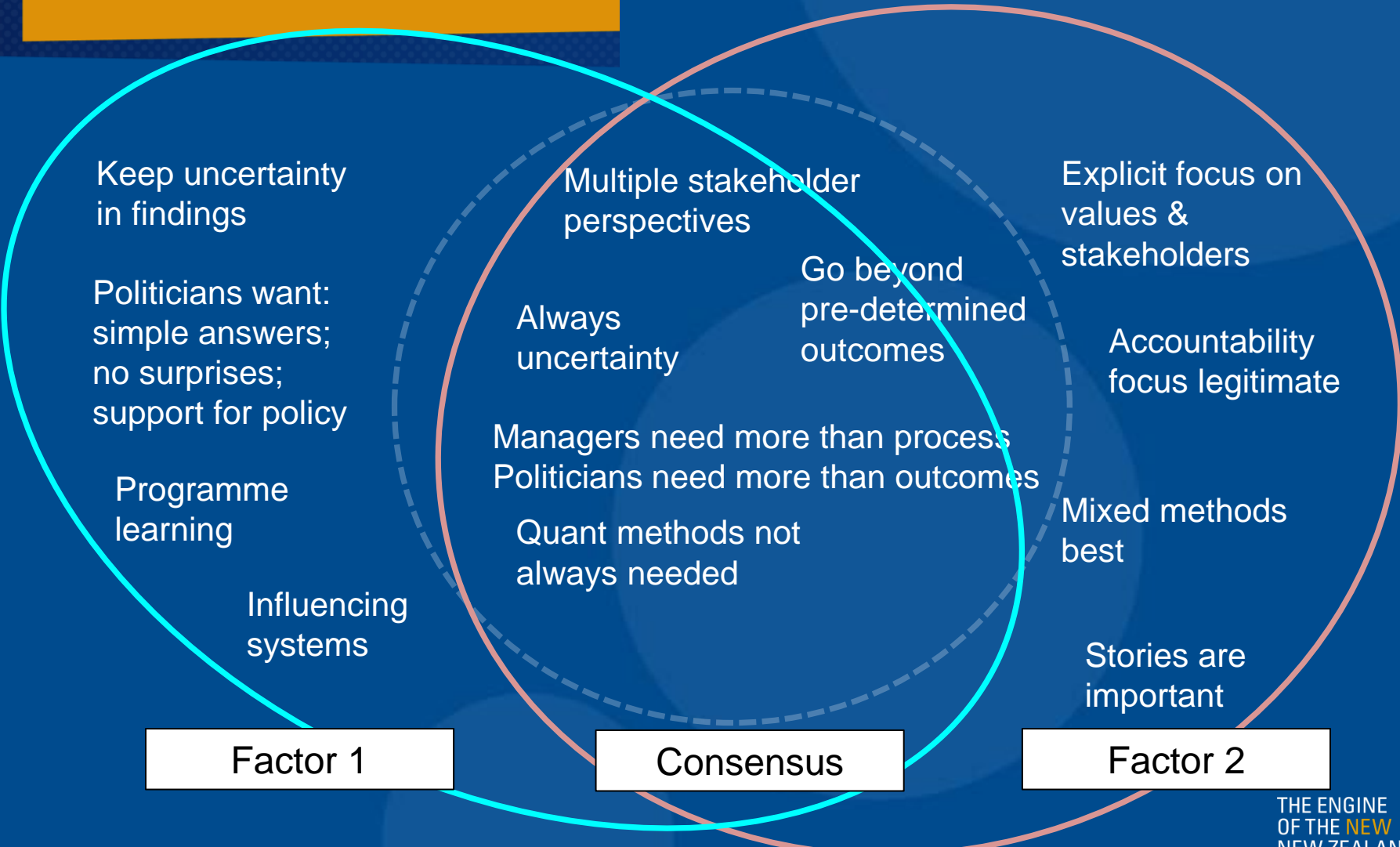
Results

Two factors identified

	Factor 1	Factor 2
Eigenvalue	6.09	1.12
Variance	41%	7%
Significant Sorts	8	4



Results



Keep uncertainty in findings

Politicians want: simple answers; no surprises; support for policy

Programme learning

Influencing systems

Factor 1

Multiple stakeholder perspectives

Always uncertainty

Managers need more than process
Politicians need more than outcomes

Quant methods not always needed

Consensus

Go beyond pre-determined outcomes

Explicit focus on values & stakeholders

Accountability focus legitimate

Mixed methods best

Stories are important

Factor 2

Factor 1

“Traditional analysts learning new tricks”

The analysts role is to provide a balanced perspective of stakes involved, but ultimately politicians who represent constituents make the value judgements

Factor 1

What constitutes good evidence?

- Numbers are important but not paramount
- Stories are useful, but not always persuasive
- Understand what works and why for programme learning
- More focus on learning for system improvement than narrow accountability
- Communicating complex and uncertain evidence is key task

Factor 2

“Analysts as process facilitators”

Policy decisions are not an endpoint but a process. Analysts actively draw boundaries around an issue and strive to communicate to decision makers a multi-perspective view. Promoting consensus decision making.

Factor 2

What constitutes good evidence?

- Promoting understanding of diversity of perspectives around an issue
- Mixed methods – stories and numbers
- More critical focus on boundaries and range of outcomes
- Views accountability as learning to improve outcomes for stakeholders

Q Methodology Summary

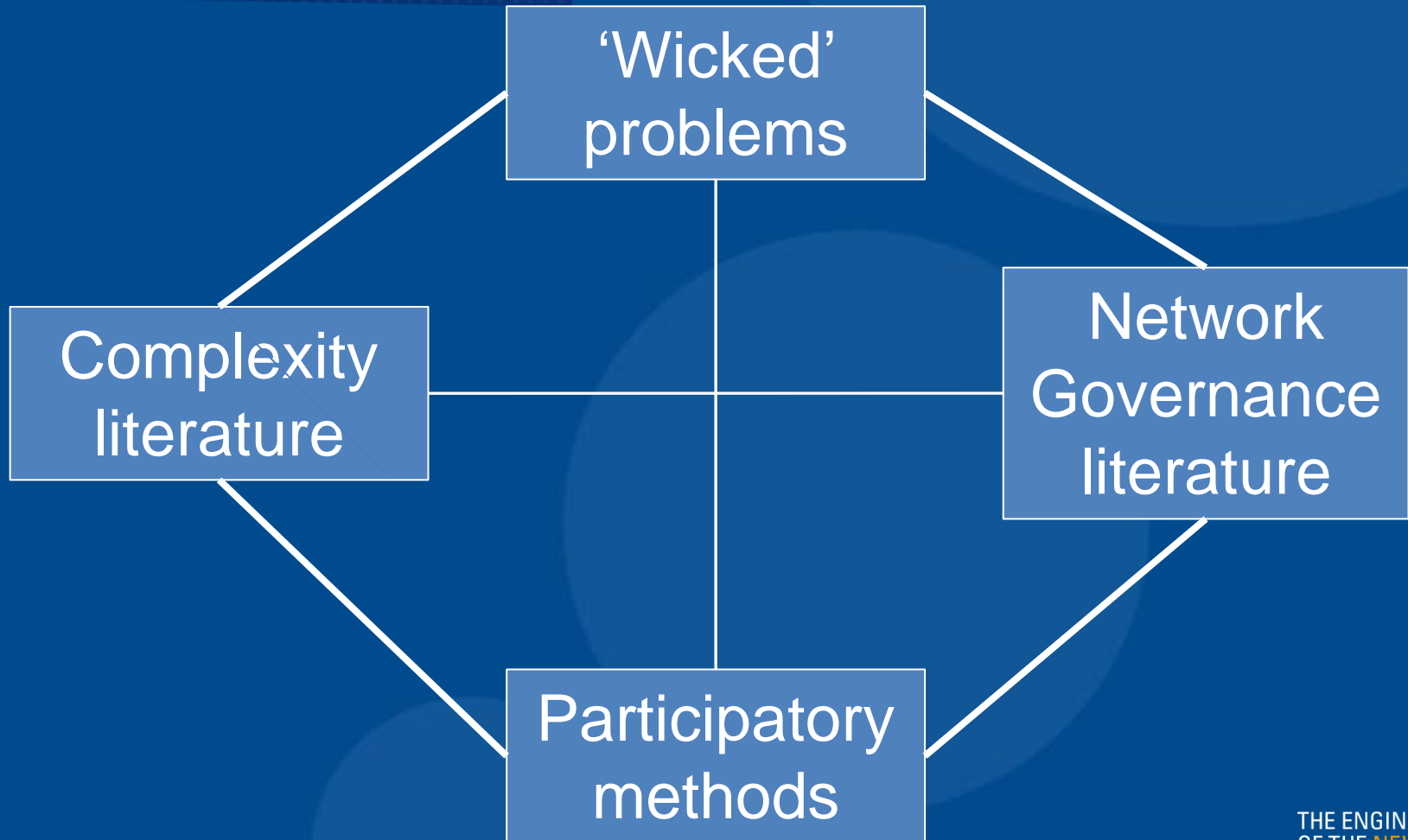
Factor 1

- Complexity theory offers some new tools for policy
- Tools applied within constrained political process that favours simplicity of findings

Factor 2

- Complexity theory informs more participatory policy processes
- Analysis tools/process to be inclusive and move towards consensus

Network Governance



Network Governance

Public policy making and implementation through a web of relationships between government, business and civil society actors

Klijn, E. H. (2008) Governance and governance networks in Europe. *Public Management Review*, 10(4). P. 511

- Developed to create or manage solutions for ‘wicked’ problems
- Can be closed set of experts, or open network of participants
- Can be mandated by government or generated from grass roots

Implications for programme governance

Implementing Complexity through Network Governance:

- Network governance consistent with complexity design principles
- Policy and implementation through a web of relationships
- Multiple perspectives within deliberative decision-making
- Space and ability to consider complex findings
- Require delegated authority and political trust

Part Four

Implications for policy work

Implications of complexity theory for policy practice

Eppel, Matheson & Walton (2011):

- Surprises will happen – well articulated vision is useful, hard targets less so
- Policy processes are continuous. Design and implementation and evaluation go hand in hand
- Local flexibility in intervention design required
- Complexity implies there is no one solution to any problem, nor than one solution will work across systems

Eppel E, Matheson A and Walton M. (2011) Applying complexity theory to New Zealand public policy: Principles for practice. *Policy Quarterly* 7: 48-55.



Implications of research findings

- Application of complexity tools within a factor 1 perspective represents a relatively minor advance to policy analysis
- Even when complexity lens asked for, the policy process that the results of analysis are applied within may not embrace complexity
- Lack of familiarity with complexity tools a barrier to implementation

Implications of research findings

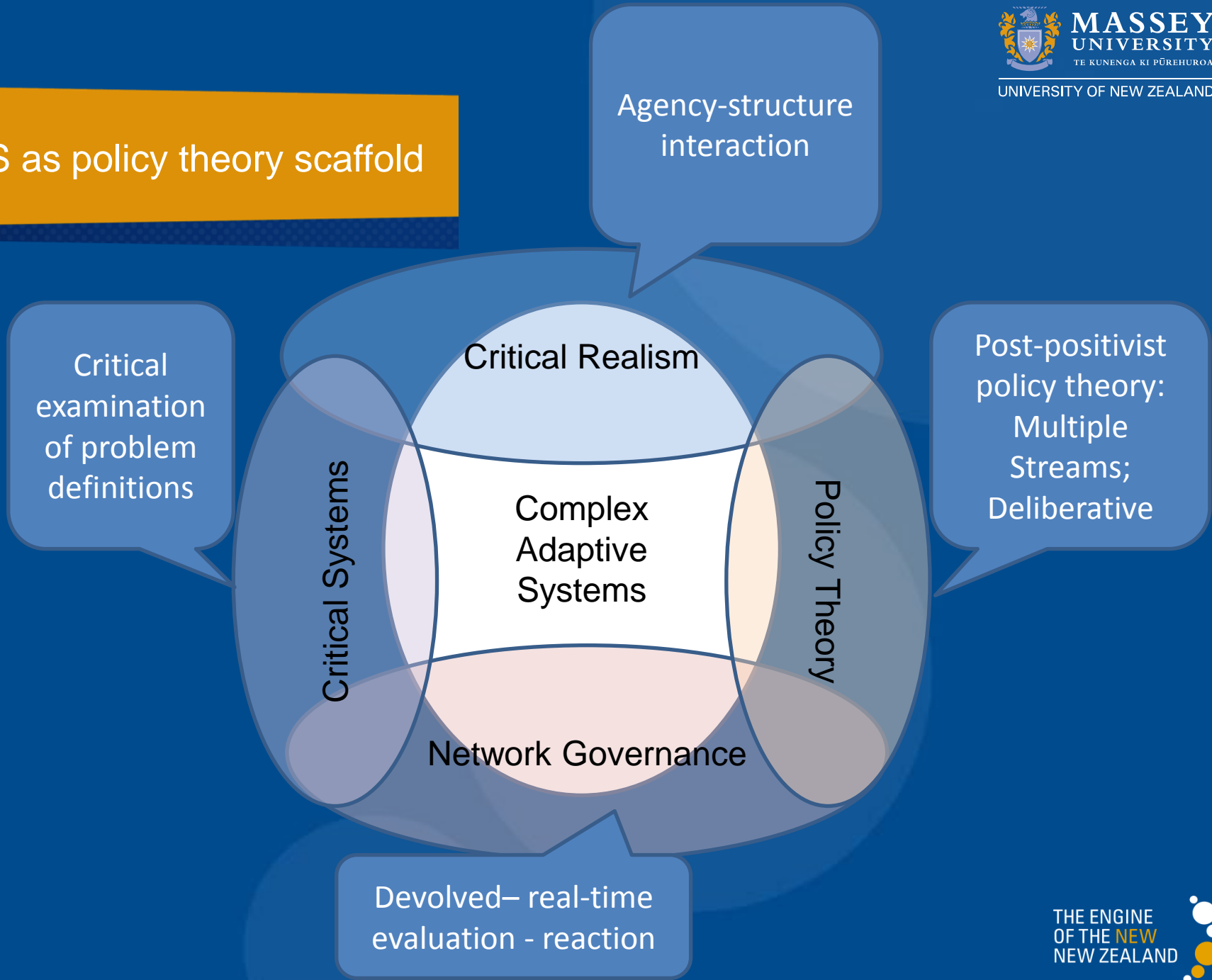
- A more radical approach is factor 2 combined with a wider application of network governance
- Direct engagement and empowerment of actors across a system to make ongoing reflective use of data for programme improvement
- Acknowledge uncertainty in outcome, develop certainty in process



A revolution?

- Factor 1 is not a revolution
- Factor 2 could be – but – complexity theory is providing additional lens to this approach. Participatory policy methodologies have been around for a while informed from multiple theoretical perspectives.
- Complexity theory can *and should* be more than a shiny new model for analysis. But it is less than an entire revolution for policy work.

CAS as policy theory scaffold



Thank you

Mat Walton

School of Public Health
Massey University

m.d.walton@massey.ac.nz