Complex System Modelling in Brazilian Public Policies

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The Product Diffusion Curve

- Innovators (2.5%)
- Early Adopters (13.5%)
- Early Majority (34.0%)
- Late Majority (34.0%)
- Laggards (16.0%)

% of people in market

Time
The Munro Review of Child Protection: Final Report

A child-centred system

Professor Eileen Munro
4.38 Whatever the reason for conducting a case review, the principles of how to study professional practice using a systems approach remain the same. In the child protection field, SCIE has taken a lead in adopting and adapting this approach to learning. The SCIE Learning Together model has been designed specifically to apply to cases involving multi-agency work and can also be applied to any example of professional practice. Feedback from participants of case reviews completed using this model in the North West of England and underway in the West Midlands and London using this model has been very positive about process and outcomes. There is therefore a workable model for use in reviewing multi-agency child protection and safeguarding work. It contains the key theoretical assumptions so the review recommends that this is taken as an illustration for future developments. Given how new the use of this approach is in the child protection field, it will necessarily be augmented over time. The explicit focus on ongoing research and development activity that SCIE has initiated, conducted in close collaboration with the sector, should continue.
Improvement Leaders' Guides: Process and Systems Thinking

Four guides based on the industrial models of processes, systems and flow:

**ILG 2.1 Measuring for Improvement**

Measures for improvement will help you understand the impact of the changes you have made, share your successes when things go well and learn when things don’t go so well. This guide will help you to develop the key measures of improvement.

**ILG 2.2 Matching Capacity and Demand**

This guide complements the Improvement Leaders’ Guide to process mapping. By helping you to identify where there are delays to the patient flow and working to remove or reduce the restrictions you can bring about dramatic improvements to patients’ healthcare journeys often without investment in more staff, equipment or facilities.

**ILG 2.3 Improving Flow**

This again builds on the Improvement Leaders’ Guide to Process mapping. It will give you better understanding about why there are so many interruptions to a patients journey and give you more ideas about how to help them flow through our health care system with minimal delays and disruption.

**ILG 2.4 Working in Systems**

What is a system? How do processes relate to systems? How do patients experience our healthcare system? This guide will help you
Strategy of the chapter

- Search for research in Brazil on complexity and public policy.
- Today’s research is likely (but not guaranteed) to be the seeds of practical applications.
- Assumption: research focuses on most pressing issues in the country’s circumstance.
- Alternative: research focuses on what is in the international literature.
Outline

1. The Nature of Public Policies in Brazil.
2. Public policies in complex scenarios.
3. The failure of traditional public policy in a complex domain.
4. Applications of complex systems in Brazilian public policies.
5. Discussion.
The nature of public policies in Brazil

- Key characteristic of political institutions in Brazil: Strong Executive.
- Yet, strong checks and balances.
- Belief: Sustainable social inclusion.
- Result since 1995:
  - Remarkable institutional strengthening.
  - Unprecedented drop in inequality and poverty.
  - Mediocre economic growth,
The nature of public policies in Brazil

- What is the nature of public policymaking in this scenario?
- Pre-1995 corporatist, inefficient, clientelistic, few islands of efficiency.
- In 1995 large reform of the public administration system along the lines of New Public Management.
  - More decentralized
  - Less hierarchical
  - Meritocratic
  - Strategic planning
  - Evidence-based
  - Efficiency and control
  - User as a client
Public policies in complex scenarios

- The fundamental contradiction between complexity and public policy.
- If you expect complexity to be a set of tools that you just incorporate into the traditional notion of public policies, you will be disappointed.
  - i.e. public policy as decision theory or game theory.
- First you must change your expectations of what it means to do public policy.
Public policies in complex scenarios

- There is little foresight, imperfect control, and surprises will happen.

- By affecting the properties of the system, such as interdependence, diversity, connectedness and adaptability, the system can be made to have the desired properties.

- Interventions can thus be achieved even though specific results may not.
“An actor in a complex system controls almost nothing, but influences almost everything.”

Scott Page (2013)
The failure of traditional public policy in a complex domain.

- Compare two public policies in Brazil, both complex, one a failure, the other successful.
- Both are social policies of the federal government.
- Both are redistributive.
  - Land reform.
  - *Bolsa Familia*.
Land distributed in Brazilian land reform equivalent to …
Table 2 – Gross Income per Farm by Farms Size (2006).

<table>
<thead>
<tr>
<th>Brackets (in min. wages)</th>
<th>Number of farms</th>
<th>%</th>
<th>Gross Income %</th>
<th>Gross Income per farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 2</td>
<td>2,904,769</td>
<td>66.01%</td>
<td>3.27%</td>
<td>0.52</td>
</tr>
<tr>
<td>2 to 10</td>
<td>995,750</td>
<td>22.63%</td>
<td>10.28%</td>
<td>4.66</td>
</tr>
<tr>
<td>10 to 200</td>
<td>472,702</td>
<td>10.74%</td>
<td>35.46%</td>
<td>34.49</td>
</tr>
<tr>
<td>&gt; 200</td>
<td>27,306</td>
<td>0.62%</td>
<td>51.19%</td>
<td>861.91</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,400,527</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
<td><strong>10.45</strong></td>
</tr>
</tbody>
</table>

What went wrong?

- Not lack of political will.
What went wrong?

- Misleading metric – number of families settled per year.
- Goodhart’s Law.
- No cadaster.
- Imperfect information, obfuscation.
- Centralized.
- Highly politicized.
- Redistributive.
Bolsa Família – conditional cash transfers

- 11 million families benefit (45 million people)
- Decentralized. Role for local governments.
- Dynamic and updated cadaster.
- No moral hazard.
- Politicized but consensual.
- ATMs.
Applications of Complex Systems in Brazilian Public Policies

Criteria for inclusion:
- Public policy.
- Brazil.
- Not purely abstract.

Method of collection:
- Initial list by force.
- Crowdsourcing.
Applications of Complex Systems in Brazilian Public Policies

- **Land Use and Urban Planning**


  - Feitosa, FF; Le, QB; Vlek, P; Monteiro, AMV; Rosemback, R. 2012. “Countering Urban Segregation in Brazilian Cities: Policy-oriented Explorations Using Agent-based Simulation.” *Environment and Planning B: Planning and Design.*
Applications of Complex Systems in Brazilian Public Policies

- **Land Use and Urban Planning**


  Furtado, B.A. 2009. “Modelling Social Heterogeneity, Neighborhoods and Local Influences on Urban Real Estate Prices: Spatial Dynamic analyses in the Belo Horizonte Metropolitan Area, Brazil,” Faculty of Geosciences, Utrecht University, Netherlands Geographical Studies.

Applications of Complex Systems in Brazilian Public Policies

- *Land Use and Urban Planning*


Applications of Complex Systems in Brazilian Public Policies

- *Economic Growth and Development*
  


- Dataviva.2014. Ferramenta de visualização que disponibiliza dados oficiais sobre exportações, atividades econômicas, localidades e ocupações de todo o Brasil, em oito aplicativos e mais de 100 milhões de visualizações. [http://dataviva.info/](http://dataviva.info/)
Applications of Complex Systems in Brazilian Public Policies

- *Economic Growth and Development*


Applications of Complex Systems in Brazilian Public Policies

- **Epidemics and Infectious Diseases**
Applications of Complex Systems in Brazilian Public Policies

- **Epidemics and Infectious Diseases**
  
  
Applications of Complex Systems in Brazilian Public Policies

- **Public Health**


Applications of Complex Systems in Brazilian Public Policies

- **Environment and Climate Change**


Applications of Complex Systems in Brazilian Public Policies

- **Financial Markets and Crises**


Applications of Complex Systems in Brazilian Public Policies

- **Financial Markets and Crises**
Applications of Complex Systems in Brazilian Public Policies

- **Agent-based Modelling and Computer Simulation**

Applications of Complex Systems in Brazilian Public Policies

- **Crime and Urban Problems**


Applications of Complex Systems in Brazilian Public Policies

- **Energy, Transportation and Infrastructure**
Applications of Complex Systems in Brazilian Public Policies

- **Social Networks**
Discussion

- Which deserving areas have not been covered?
Discussion

- Which deserving areas have not been covered?
  - Education
Discussion

- Which deserving areas have not been covered?
  - Education
  - Deforestation
  - Biodiversity
  - Innovation
  - Industrial organization
  - Pollution
  - Traffic
  - Social assistance
  - Political science