Modeling and Simulation of Political Change Phenomena

Political Culture-Based Models of Society and Polity

Camelia Florela Voinea
Department of Political Science, International Relations and Security Studies
Faculty of Political Science
University of Bucharest
Romania
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Agent-Based Modeling of Social and Political Phenomena

Social Sciences:
- Social Modeling
- Social action model (Coleman, 1990)

Agent-Based Modeling and Simulation Systems

Artificial Society

Reference model(s):
“Sugarscape” Model  
(Epstein and Axtell, 1996)

Political Science:
- Political Methodology
- International Relations (Axelrod, 1995)

Agent-Based Modeling and Simulation Systems

Artificial Polity

Reference model(s):
“RebeLand” Model  
(Cioffi-Revilla and Rouleau, 2009)
Political Phenomena Modeling

Social Simulation & Computational Sociology

Agent-Based Models:
- micro-level agents
- micro-to-macro phenomena

“emergence”

Computational Political Science & International Relations

Agent-Based Models:
- macro-level agents
- macro-to-micro phenomena

“downward causation”
Aim of Approach

Modeling

Paradigm: Political Culture

What?
- macro-level agents
- macro-to-micro phenomena ("downward causation")

How?
Operational concept: "bottom-up" architectures revisited
- Mechanisms: interaction and relational
- Processes
- Pathways
Modeling Paradigm

- Political Culture: “thick-and-thin” neo-cultural synthesis (Mishler and Pollack, 2003)
- Political Phenomena Modeling: multiple “thick-and-thin” continua
  - interaction continuum
  - interconnection continuum
  - (political) culture continuum
Modeling Political Phenomena

"Thick & Thin" Continua

- Macro level
- Micro level

Legend:
- Interaction continuum
- Relational continuum
- Political culture continuum

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Multi-layer Architecture

Multi-Layer Mechanism Architecture

(p)olitical culture mechanisms

social mechanisms

survival mechanisms

individual actions and interactions

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Artificial Polity Simulation Model
Political Culture

- Recurrent Phenomena
- Cross-Recursive Processes

**Trust** ← {Attitude, Belief, Values, Norms}

**Recurrence**: 
(1) based in individual interactions (“emergence”) and 
(2) in political culture (“downward causation”)
Experimental Models

- Political Culture-Based Models:
  - briberscape
  - privilegescape
  - baronscape

- Model structure:
  - Agents: environment, social (interaction), culture
  - Simulation system: Artificial Polity
Polity Models

Two main polity models:

1. Communist Polity Model (CPM)
   - a. Generalized network of trust; included in polity;
   - b. Coercive centralized control and the macro-level emergence of parallel autonomous networks of trust (patro-client networks)

2. Democratic Polity Model (DPM)
   - a. Insulation of existing categorical inequalities from public politics
   - b. Incorporation and expansion of existing trust networks into the polity

The Simulated Political Mechanisms in the Artificial Polity Model

<table>
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<tr>
<th>Simulation Scenario(s)</th>
<th>Networks of Trust</th>
<th>Inequality</th>
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| Authoritarian Polity Model (CPM) | a. Generalized network of trust; included in polity;
|                           | b. Coercive centralized control and the macro-level emergence of parallel autonomous networks of trust (patro-client networks) | a. Coercive control of the access to resources enables relations of exploitation
|                           |                                                                                 | b. Generalized categorical inequalities in public politics                                           |
| Democratic Polity Model (DPM) | a. Insulation of existing categorical inequalities from public politics          | a. Dissolution of coercive controls supporting current relations of exploitation
|                           | b. Incorporation and expansion of existing trust networks into the polity         | b. Insulation of existing categorical inequalities                                                  |

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Thank you!