Game Theory and Thesis

- Research Design
- The Choice of Game Theory as a Method
- Continued Learning
Role of Strategy in Policy and Modeling

- **Descriptive Modeling**: We see associations between variables, but we do not understand why they happen.
- **Causal Modeling**: We incorporate theories of cause and effect to describe relationships between models.
- **Policy Modeling**: We have sufficient understanding to intervene in systems with new designs, delivering never before achieved outcomes.
- **Strategy Modeling**: We understand how to deliver policy outcomes in the face of multi-actor complexity.

(Porter et al, 2010)
The Arch of Knowledge
(Book by Oldroyd, 1986)

Arch at Palmyra. Photo by Diemert (cc-by-1.0 license)
Game Theory Strengths and Weaknesses

Strengths
• Sound theoretical basis
• Transparent reasoning
• Emphasizes strategic communication
• Emphasizes critical thinking
• Good for the highest level of models involving strategic thinking
• Ably be combined with other research techniques
• Capable of using in various degrees or dosages

Weaknesses
• Incomplete without empirical evidence
• Should be supplemented with techniques to establish costs, values, utilities, payoffs
• Currently few tools to support policy analysts
• No uniformly agreed upon approach
What Is Game Theory?

- For purposes of gaining insight, strategizing, arbitrating or communicating about multi-actor systems
- You don’t uniformly do any one thing when you use game theory
- You don’t uniformly believe any one thing when you adopt the game theory approach
- A collection of components
A Range of Game Theory Approaches

- Strategic communication
- Computer and Agent Models
- Formal Modeling
- Proof Construction

- Actor or Stakeholder Analysis
- Process Management
- Mechanism Design

QUALITATIVE

QUANTITATIVE
Actor Analysis Redux

But there are characteristic things that game theorists examine again and again regardless of the setting:

- Players
- Payoffs
- Information
- Strategies
- Coalitions
- Solution Concepts

Bali dance masks. Photo by Gunkarta Gunawan Kartapranata (cc-by-sa-3.0)
Off the Rack Solutions

- Actor Analysis / Soft Operations Research Methods
- Agent-Based and Evolutionary Approaches
- Arbitration, Mediation and Negotiation Methods
- Power Indices
- Policy Theories
- Experiments and Gaming

Clothing on a rack. By Rico Shen (cc-by-sa-2.0)
Good Combinations with Game Theory

• simulation, optimization or modeling to establish payoffs
• case study work to anchor reasoning and gather facts
• gaming or experiments to develop pointed research designs or to strategically analyze
• expert opinion, interviews or surveys to determine what people really care about
• scenarios to help plan in the face of strategic uncertainty
• theories, to seek generalizeable knowledge
• Problems or applications to develop small, but approachable models
Two Good Follow-Up Books

[Image of a book cover titled "Game Theory Evolving" by Herbert Gintis]

[Image of another book cover titled "Games and Information: An Introduction to Game Theory" by Eric Rasmusen]
Some Future Directions for Learning