

Actor (and network) models

Leon Hermans

29-06-10

This research seminar

Introduction to Actor Models

1. What are actor models and why are they important in this course?
2. What types of models are there?
3. How do they relate to game theory?

An overview of models, but no specific examples; these will follow later in the course...

Actors matter on all levels: from local to international

- Example: climate change negotiations in Bali, 2007:
[http://www.youtube.com/watch](http://www.youtube.com/watch?v=...)



Photo published online by Oxfam International under cc-by-2.0 license.



Photo published online by Malte at da.wikipedia.org under cc-by-2.0 license.



Photo by Lauri Myllyvirta, published online under cc-by-2.0 license.

Actors are central

But what are they?

EPA1121:

- Actors are often groups and organizations, but also (important) individuals can be considered as actors
 - In fact, actors are often multi-layered, nested entities ('composed actors')
- Actors:
 - Have a certain interest in the system, and/or
 - Have some ability to influence that system
- Network:
 - more or less stable patterns of social relations between actors
 - Networks take shape around policy problems or programmes

How does this compare to the terminology used in game theory?

What are actor models?

“Models that help to explain the role and position of actors in policy- or decision-making”

Are game theory models also actor models?

This is a quite broad answer – looking at the assumptions that underlie actor models will give a better understanding of what actor models are

Assumptions behind actor models

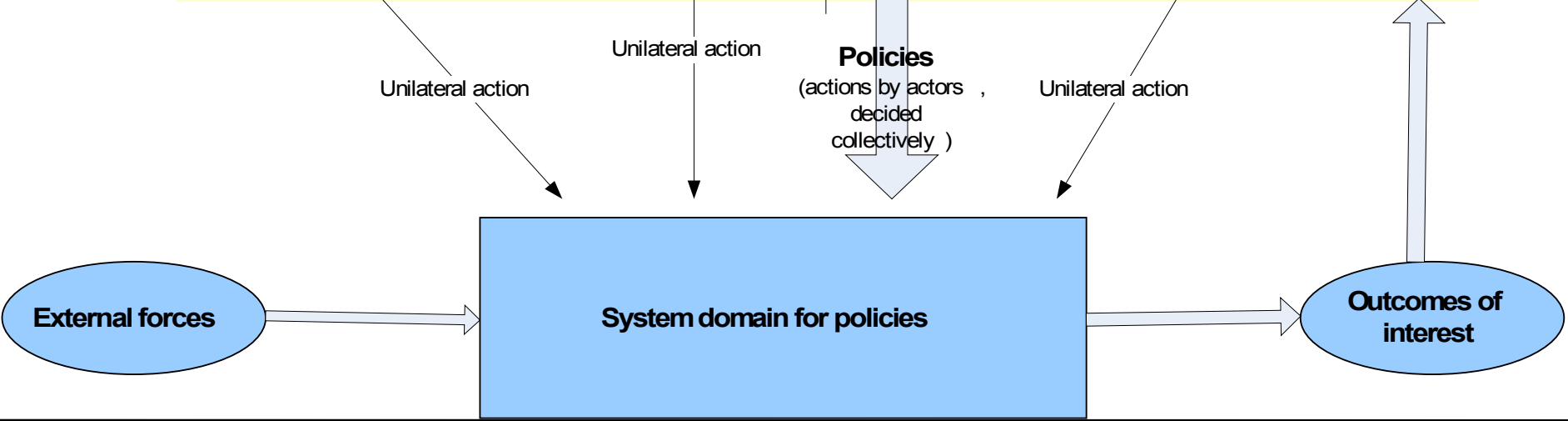
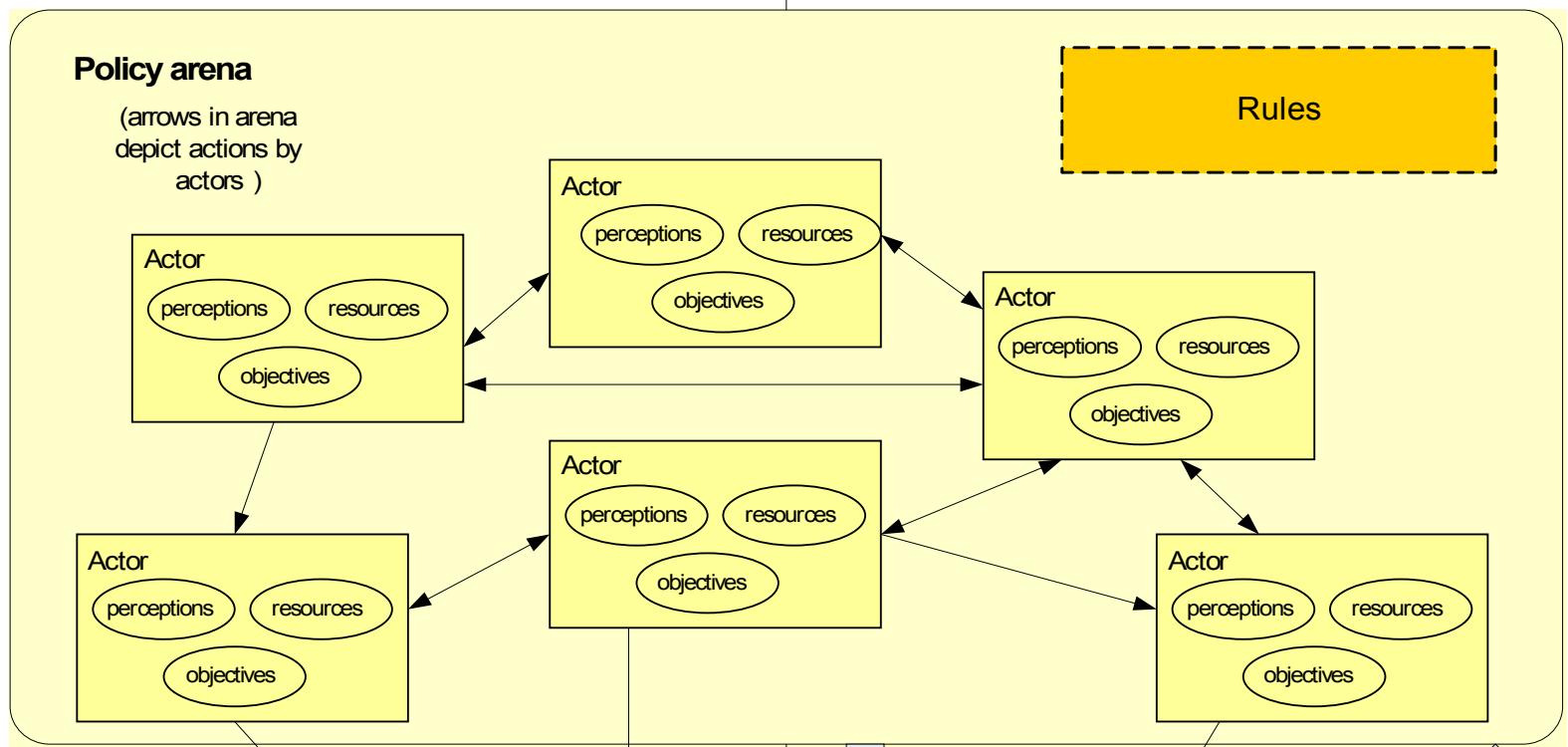
1. Rationality

- Behaviour of actors in policy processes is mainly rational / strategic
 - As opposed to mainly intuitive, emotional or impulsive
- Rational behaviour is influenced by:
 - **Objectives**, interests and underlying values
 - **Perceptions** ('how the world operates')
 - **Resources**, means and instruments to further their interests (e.g. formal authority, money, expertise, etc.)

Assumptions behind actor models

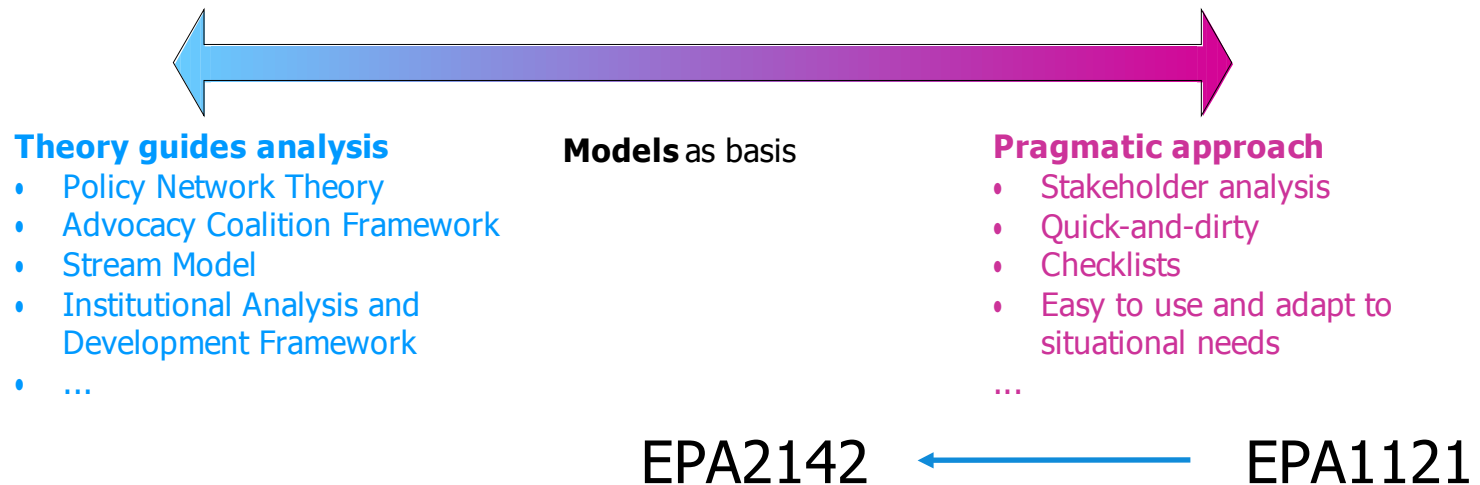
2. Network context

- Policy actors typically operate in policy networks or arenas in which multiple actors are present
 - Hence: 'Multi-actor systems'
- Actor behaviour in networks is influenced by:
 - **Network structure**
 - and the position of the actor therein
(many/few actors, hierarchical structure or not, centrality of actors, density of networks,...)
 - **Rules** in the network (formal and informal)
 - Note: actors influence networks and vice versa!



Overview of actor analysis methods

- Three general approaches:
 - Theoretical approach
 - Pragmatic approach
 - (most reported approach - stakeholder analysis)
 - In-between: Model-based approach



Model-based approach: Actor Models

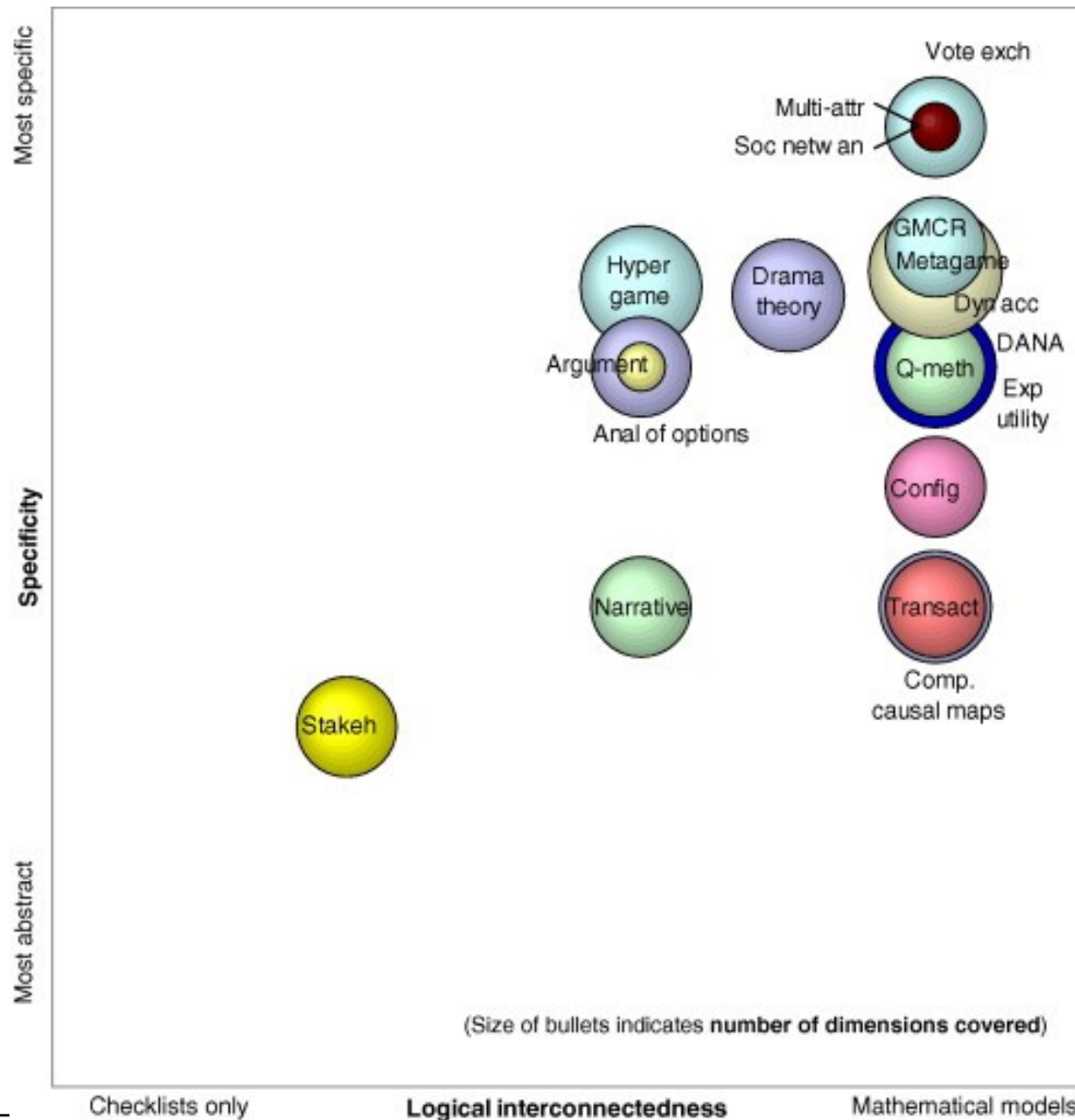
- Translation of theoretical insights into more operational models
- Theoretical basis improves transparency and focus and reduces analyst's bias
- Operationalization in models provides (some) practical guidance
- Analytical rigor comes at the expense of broadness and room for "pragmatic freedom"
- More time consuming than 'quick-and-dirty'
- Focus depends on the selected method

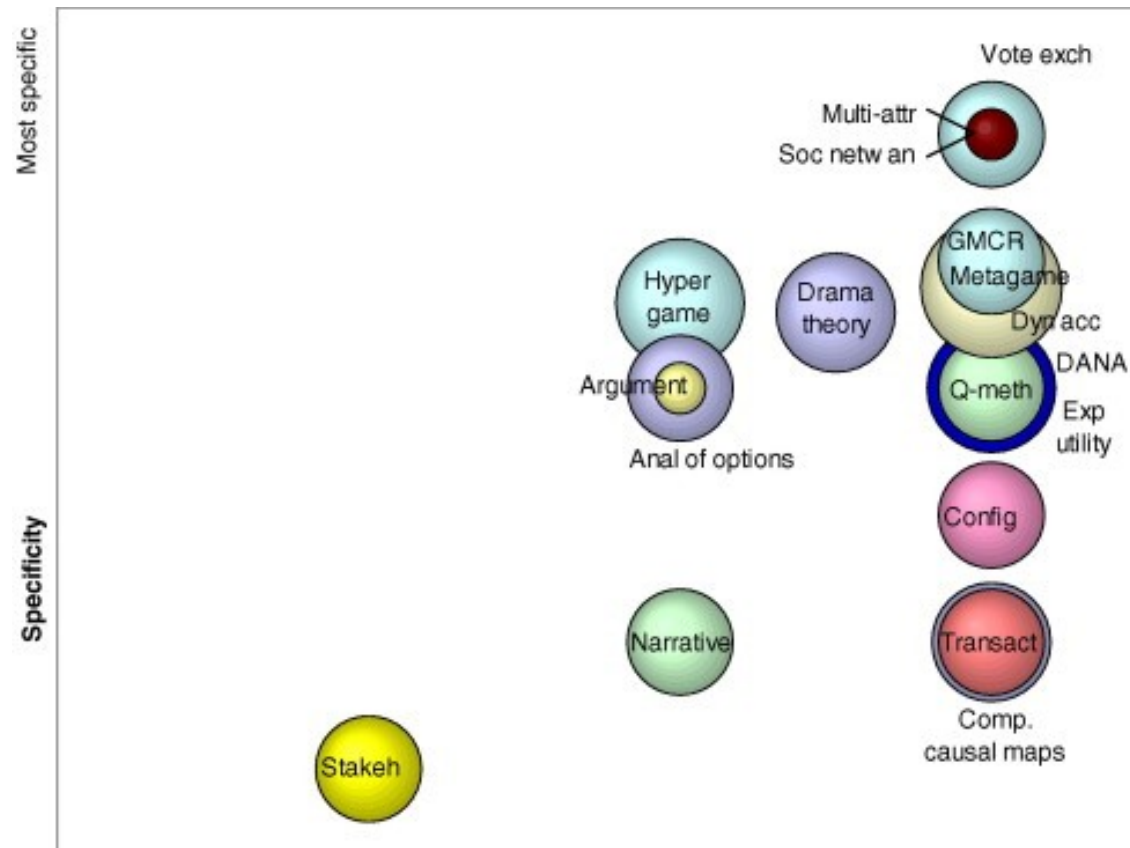
Examples of model-based approaches

Purpose	Modeling Approaches	Conceptual Focus
Supporting problem formulation	Argumentative & narrative analysis, Q-method	Perceptions and values
	Cognitive maps, dynamic actor network analysis	Perceptions and values
Modeling System Actors	Stochastic agents, social network models	Rules and networks
	Consumer choice, conjoint analysis	Values
	Agent-based models	Resources and values
	Game theory and general equilibrium models	Resources and values
Supporting process management	Game theory and conflict models	Resources and values
	Transactional and exchange models	Resources and values
	Stakeholder analysis	Often: Resources and values
Gaming	Gaming and simulation for learning, research and intervention	Various, depending on game design and game models

Comparing actor models

- Focus
 - resources, network, perceptions, values
 - see previous slides and literature (e.g. EPA1121 reader)
- Analytic quality
 - Scope
 - Specificity
 - Logical interconnectedness





What models have the 'highest analytic quality' in this figure?

Is 'highest analytic quality' always best for actor models?

What are the advantages and disadvantages?

Game theory and actor models

Translating the concepts

These game theory concepts...	...can be considered a specific type of these actor modeling concepts
Players	Actors
Strategies	Resources
Outcome	??
Payoffs	Values

What about aspects related to 'Perceptions' and 'Networks' in game theory?

So now you know...

- ... What actor models are
- ... How they can be classified, and
- ... How game theory fits in this broader context of actor models