

# Resolving Hidden Information in Open Adjudication

Matrix Games for Modern  
Wargaming  
Developments in Professional and Educational Wargames  
Innovations in Wargaming Volume 2

John Curry and Tim Price MBE



Elizabeth (Ellie)  
Bartels

8 September 2016

# Overview

- Framing the Problem
  - Merits of Open Adjudication
  - Hidden Information in Emerging Topics
  - Challenges of Hidden Information in Open Adjudication
- Anatomy of Hidden Information
  - What information is hidden?
  - When does it come into the game?
- Some Thoughts on Solutions

# Framing the Problem

# Argument 1: Open adjudication is a key way of gaming emerging issues

- When gaming emerging topics, control doesn't know more than the players\*
  - No data-generated rules
  - Adjudication illuminates the problem, which is the traditional role of players
  - If we've invited the right players, they will be as, or more expert than, the adjudication cell
- Common solution has been open adjudication
  - Players can contribute to adjudication → Leverage player expertise directly
  - Players can see control's arguments → Transparency and buy-in

\* See Stephen Downes-Martin, "Adjudication: The Diabolus in Machina of Wargaming" in *Naval War College Review*, 2014

# Examples of open adjudication

- Single Cell Seminar Game
- Matrix and Narrative Games
  - Players craft actions they want to take
  - Players present rationale of why action will or won't work
  - Control weighs arguments and outside factors (like chance) and determines outcome
- Open Board Game (ex. RFLEX)
  - Hex and counter style game system
  - Players craft actions
  - Combat adjudication resolved based on expert panel implementation of rule sets, which players can observe and advise

## Argument 2: Many emerging topics involve hidden information

- Deterrence: Goals of opponents are hidden
- Cyber: Deception and lack of clear cause or attribution, attack may limit information, effects unclear to attacker
- Space: Attacks limit information available, and effects may be unclear to attacker
- Information: Rationale of opponents (and neutral actors like the target population) hidden, lack of attribution

# The Paradox: Open adjudication of hidden information

- The gaming method we think is most appropriate for emerging issues employs open adjudication
- Hidden information is key to many emerging issues
- How do we keep information hidden while keeping adjudication open?

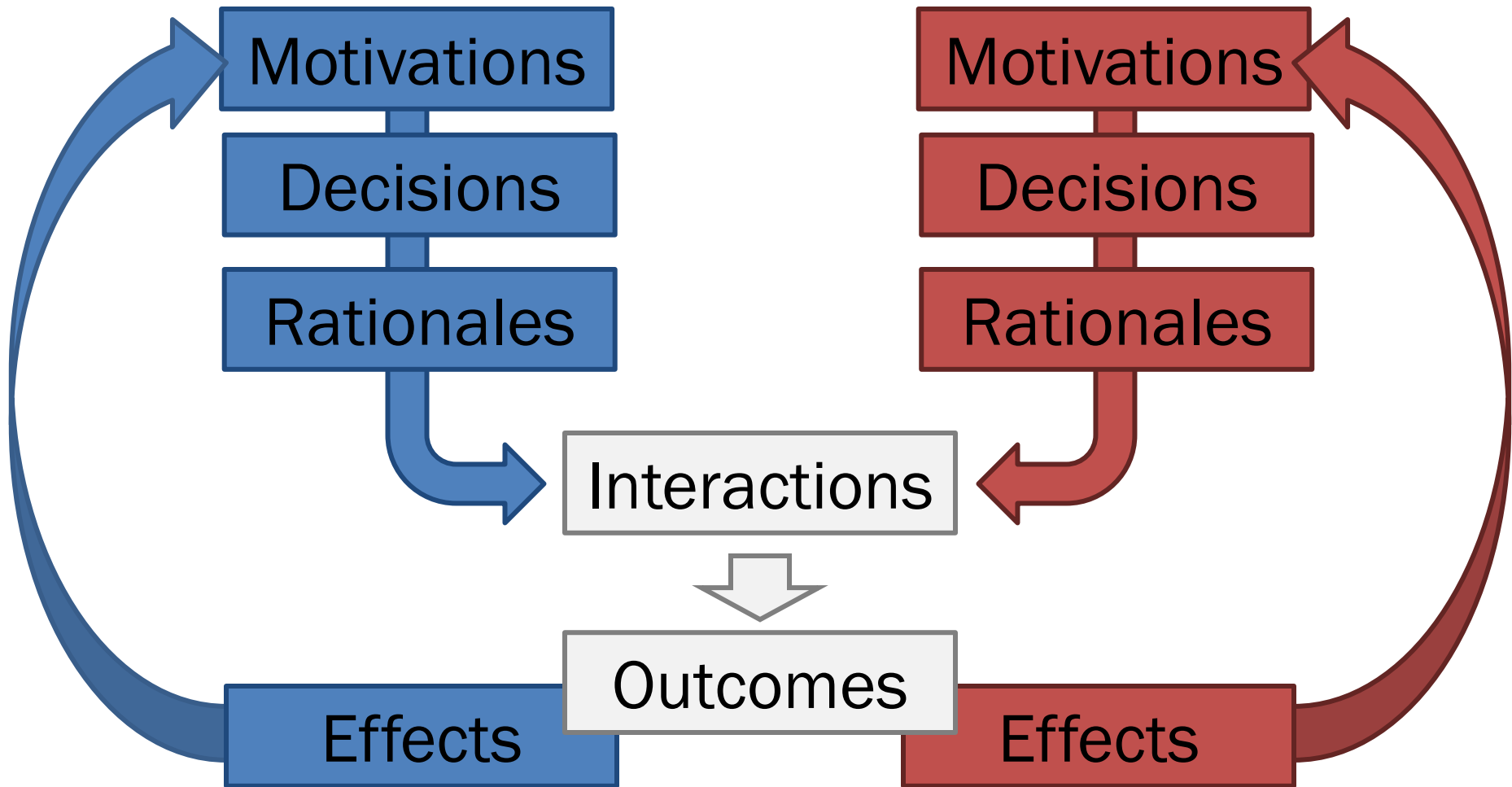
# Anatomy of Hidden Information



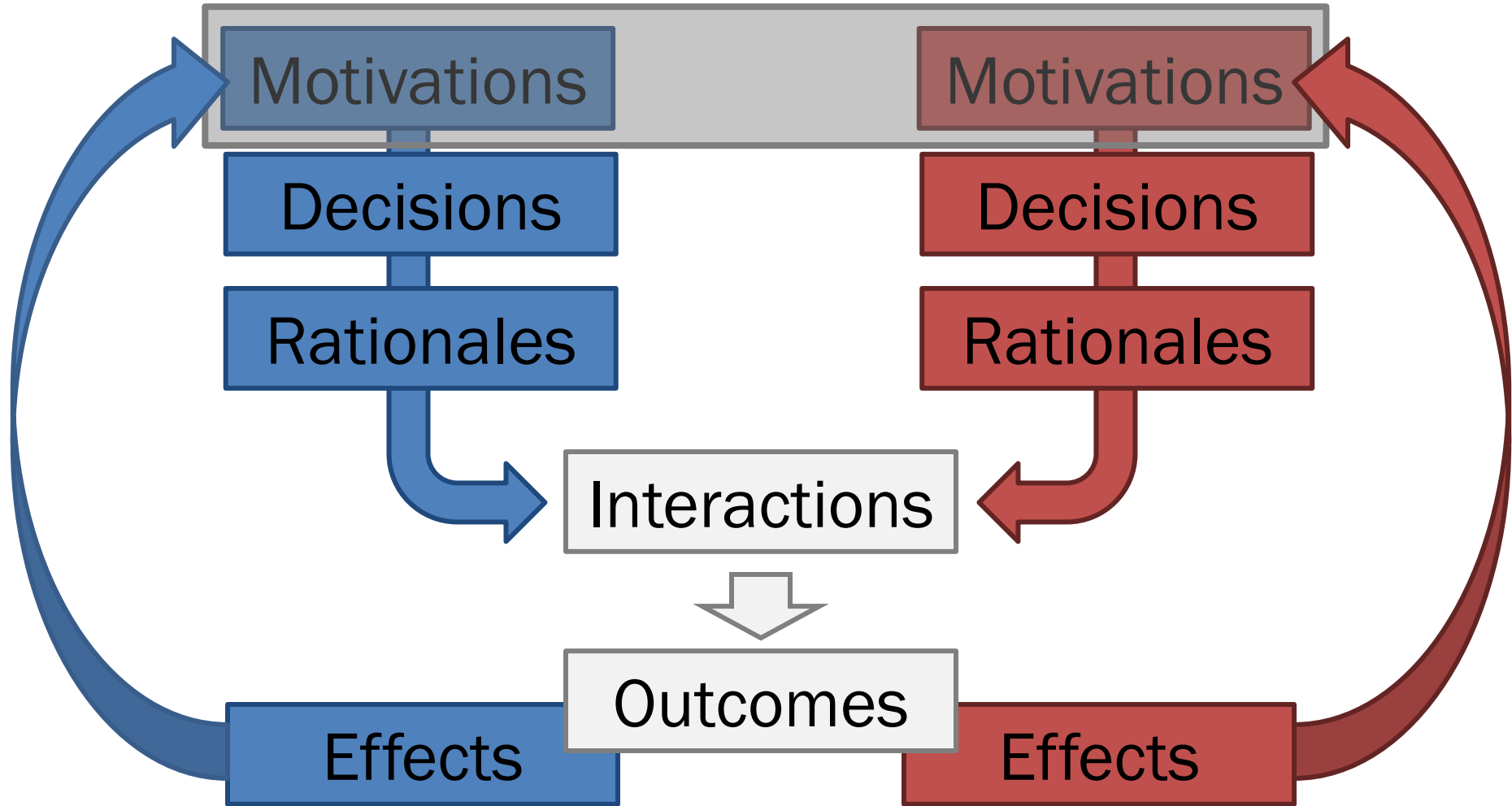
# Types of Hidden Information

- Hidden Motivation: I don't want you to know why I'm doing something
- Hidden Actions: I don't want you to see what I'm doing
- Hidden Capability: I don't want you to see how I can do something
- Hidden Effect: I don't want you to see what happens as a result of doing something

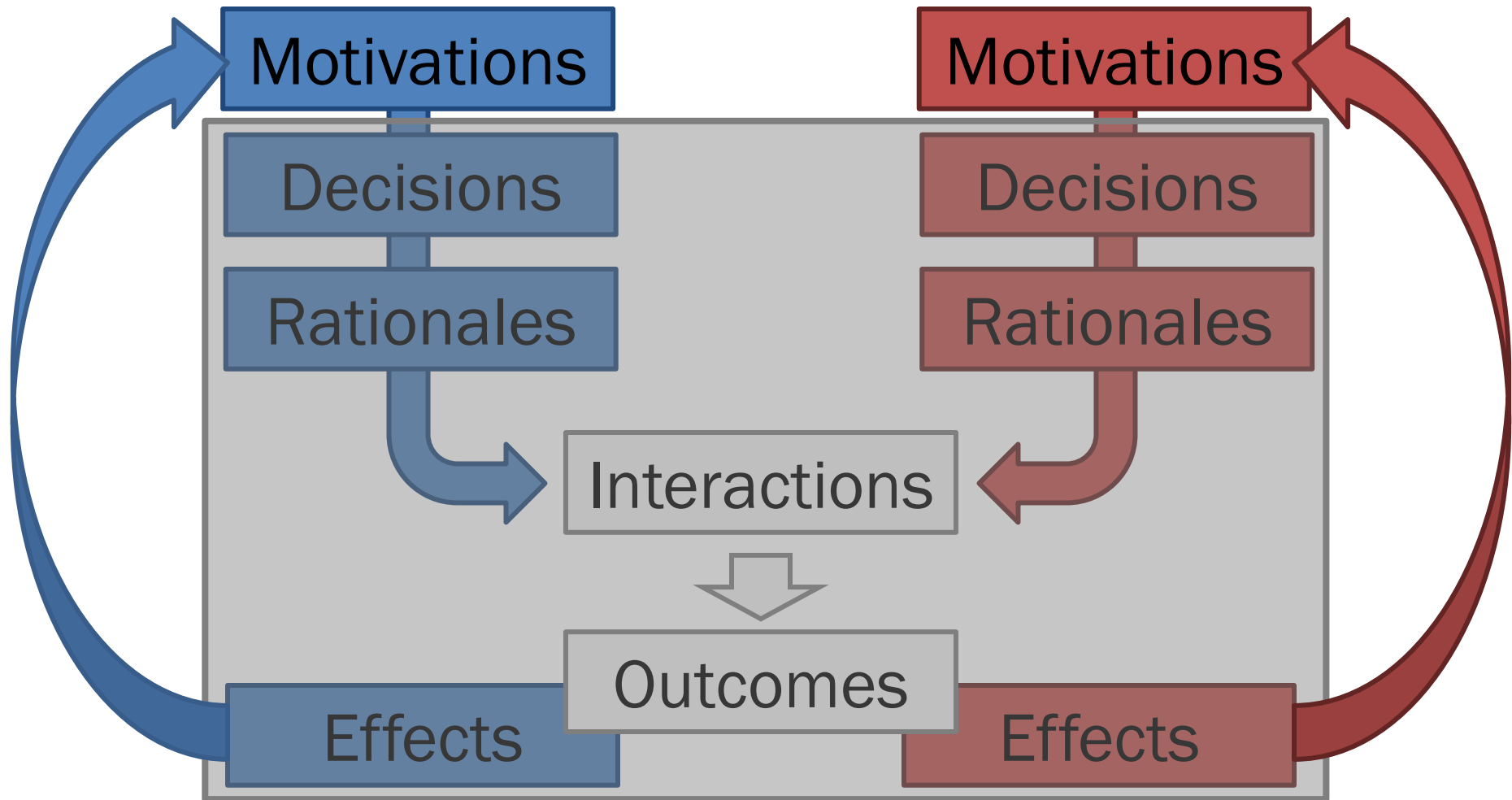
# What information is in a game?



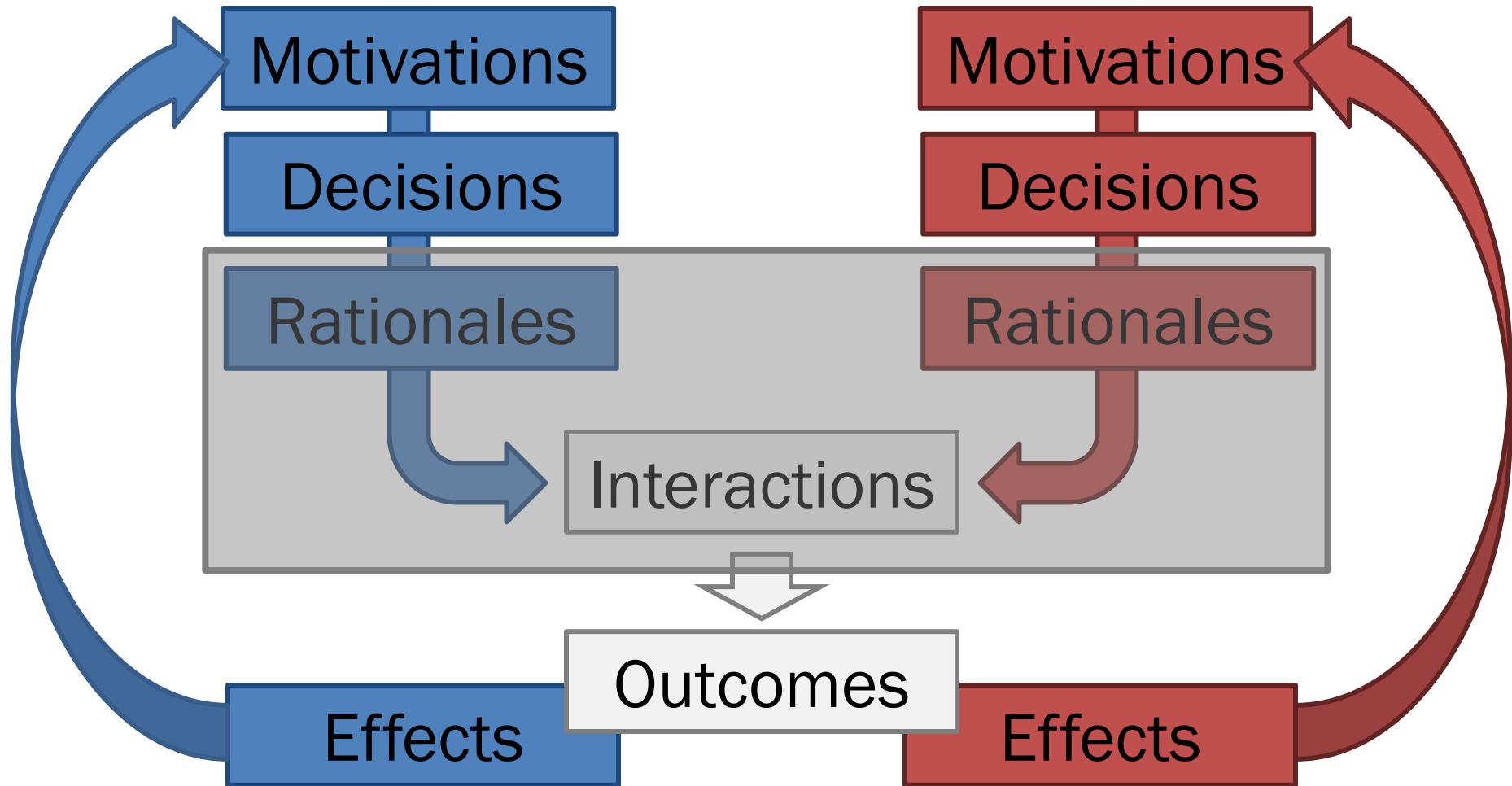
# What information is hidden to mask motivation?



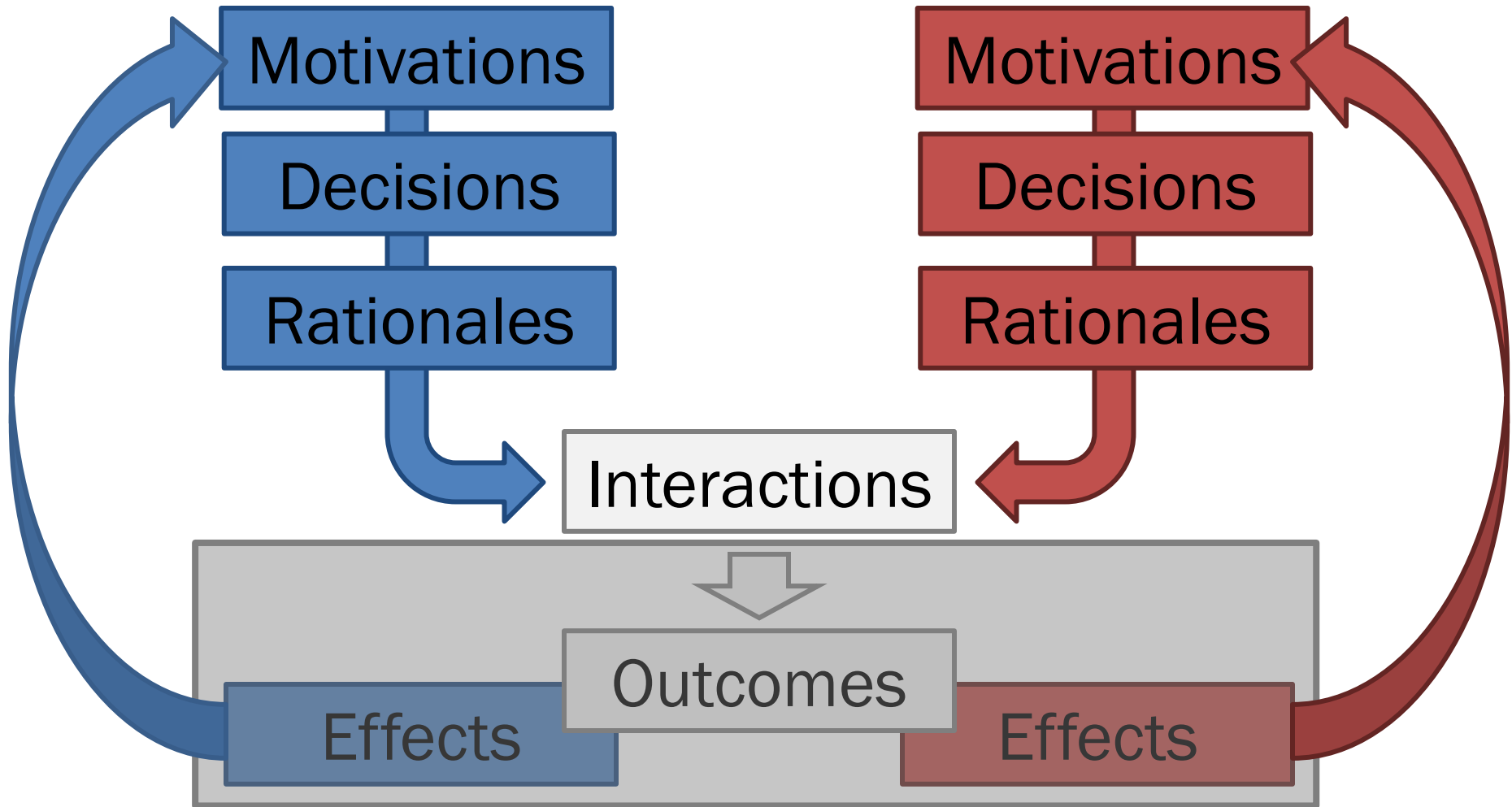
# What information is hidden to mask actions?



# What information is hidden to mask capabilities?



# What information is hidden to mask effects?



# Status Quo Solution Space

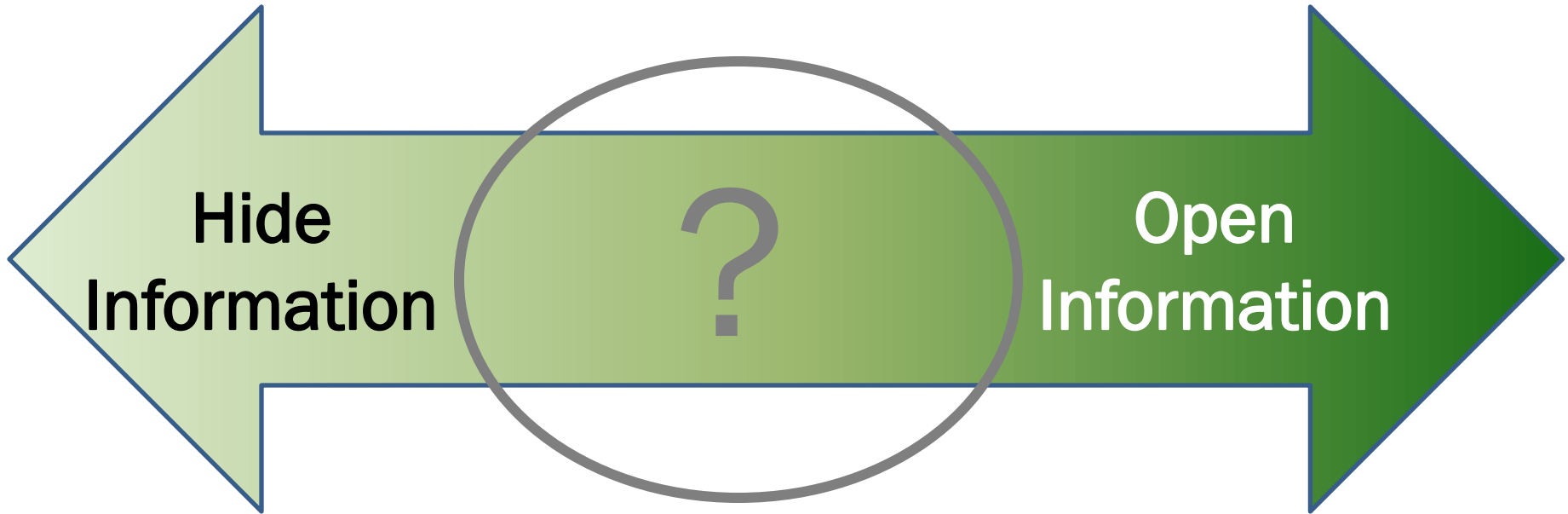
## Hidden Information

- Closed adjudication
- Cells physically separated
- Separate operating pictures with fog of war
- Limited feedback

## Open Information

- Open adjudication
- Cells co-located
- Common operating picture
- “Just forget you heard this”

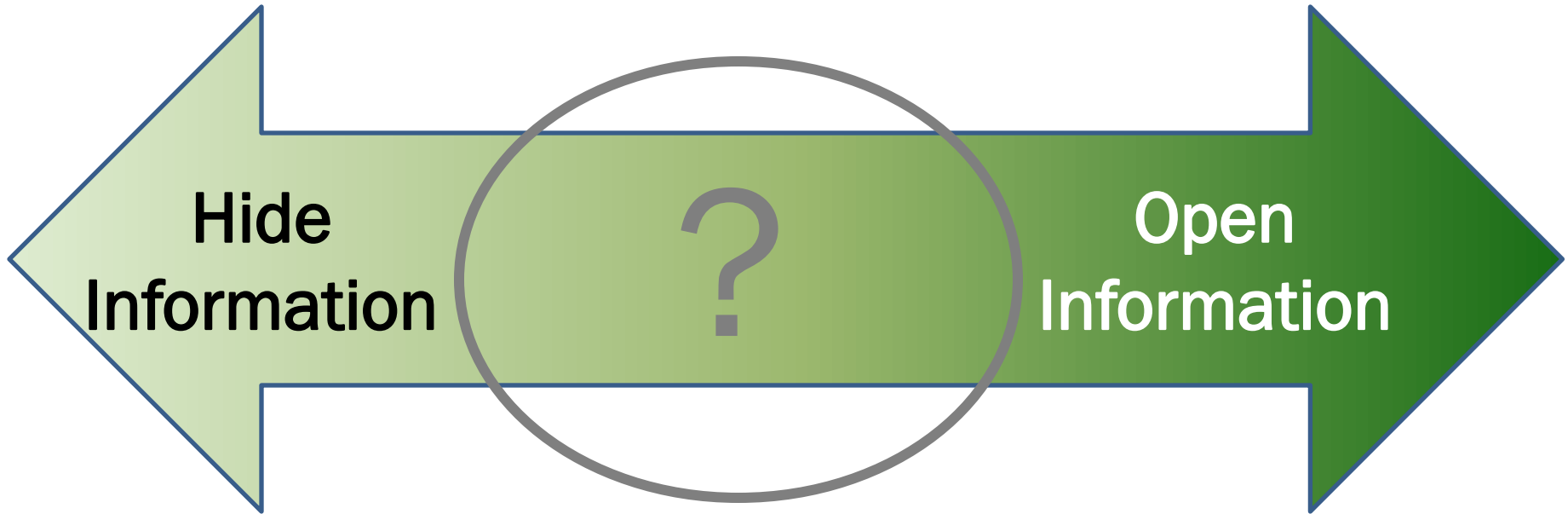
# The missing middle





# Fumbling towards Solutions

# Some traditional solutions



- Fog of War
  - Map (think Kriegsspiel or StarCraft)
  - Counters (Andean Abyss)
- Cards
  - Random Deck (Poker)
  - Custom Decks (Magic, Dominion)

# Other models for hidden information

- Face validity
  - Answer seems credible to people whose opinion matters
  - Challenge process only when outcomes don't seem plausible
- Zero-knowledge protocol
  - Answer proven to be credible over repeat interactions with a single person
  - Verify process by repeatedly observing part of the solution so that it is statistically implausible that the process doesn't work

# Structure for Hidden Motivations

## Closed Discussion, Open Adjudication

- Teams record goals and objectives in writing, visible to control but not spoken aloud
- Team describes action to give them control over what information is conveyed to opponents

Outcomes

Effects

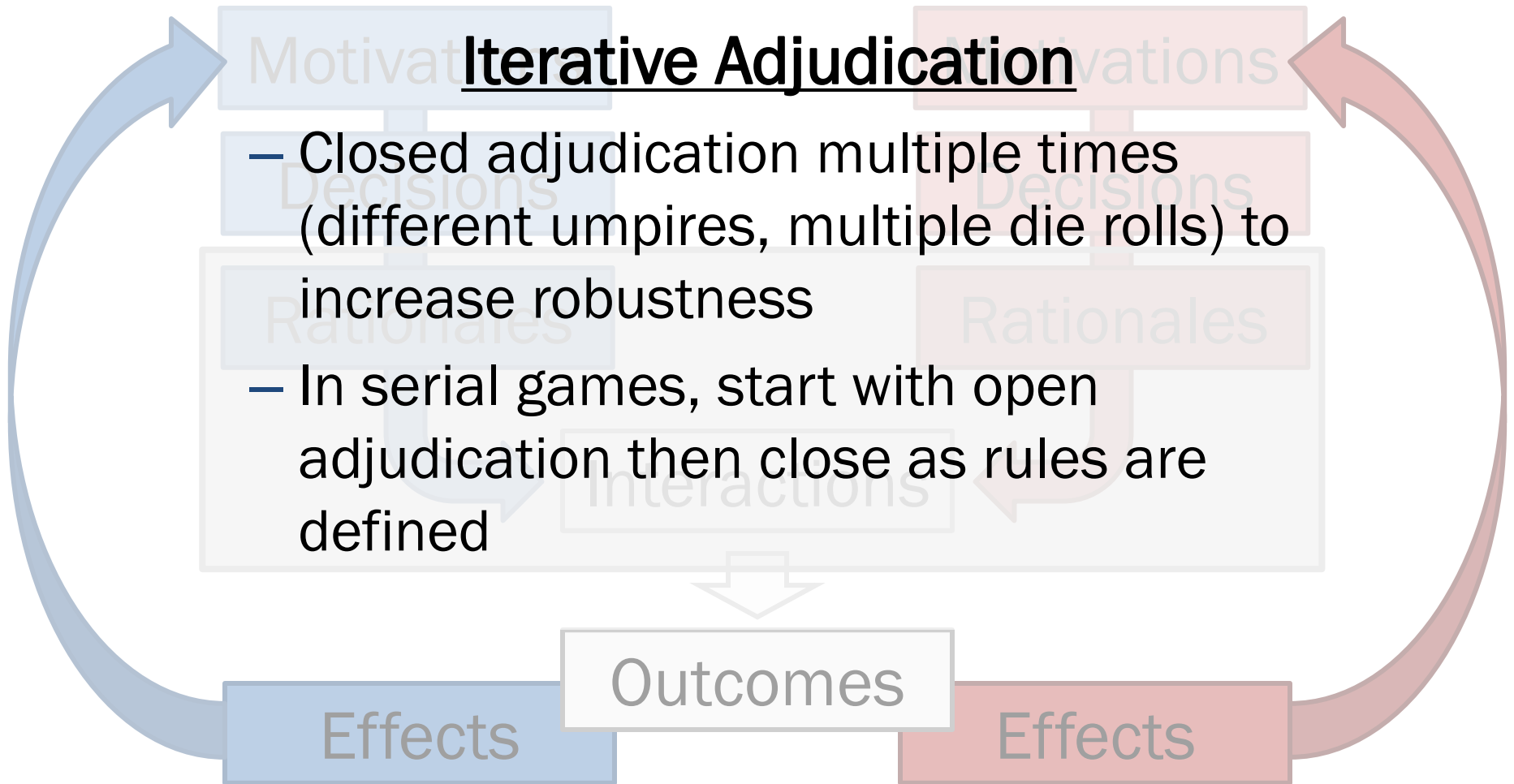
Effects

# Structure for Hidden Actions

## Iterative Adjudication

- Start game with several open resolutions of likely moves so that players can engage with the adjudication process and make necessary adjustments
- Post-game, ask players to re-adjudicate the outcomes in survey, can compare player distribution and rationales
- In serial games, start with open adjudication then close as rules are defined

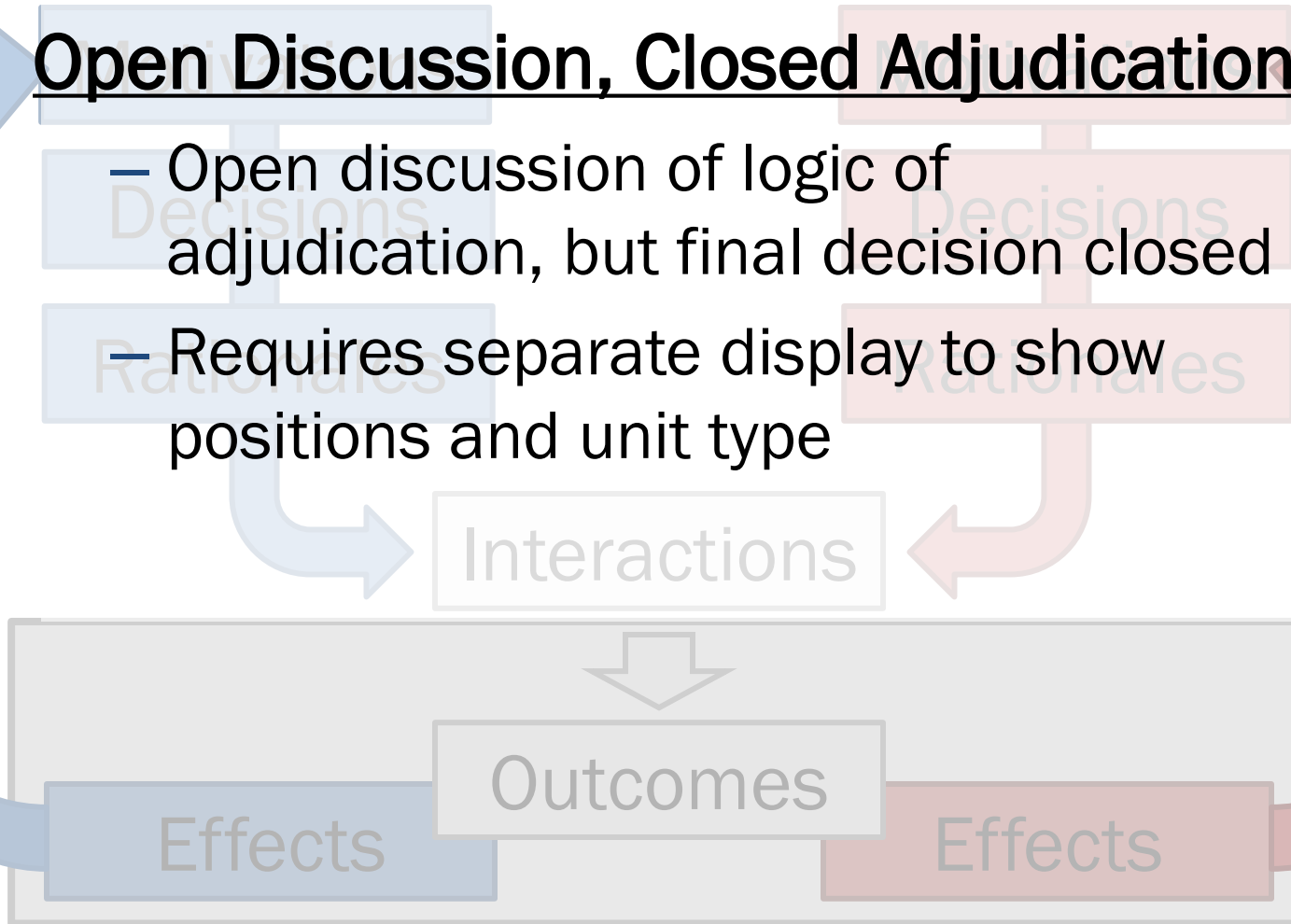
# Structure for Hidden Capabilities



# Structure for Hidden Effects

## Open Discussion, Closed Adjudication

- Open discussion of logic of adjudication, but final decision closed
- Requires separate display to show positions and unit type



# Points for Discussion

- Other solutions you have found valuable?
- Is all this extra work worth it? When? Why?



