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# Responsible Use of Wargaming to Theorize on Escalation (Including Nuclear)

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# AGENDA

## Introduction

- Who am I?
- For whom do I speak? (Me, it's just me.)

## Nuclear Context

- Past vs Present

## Games for Analysis

- Research Framework
- Questions of Interest

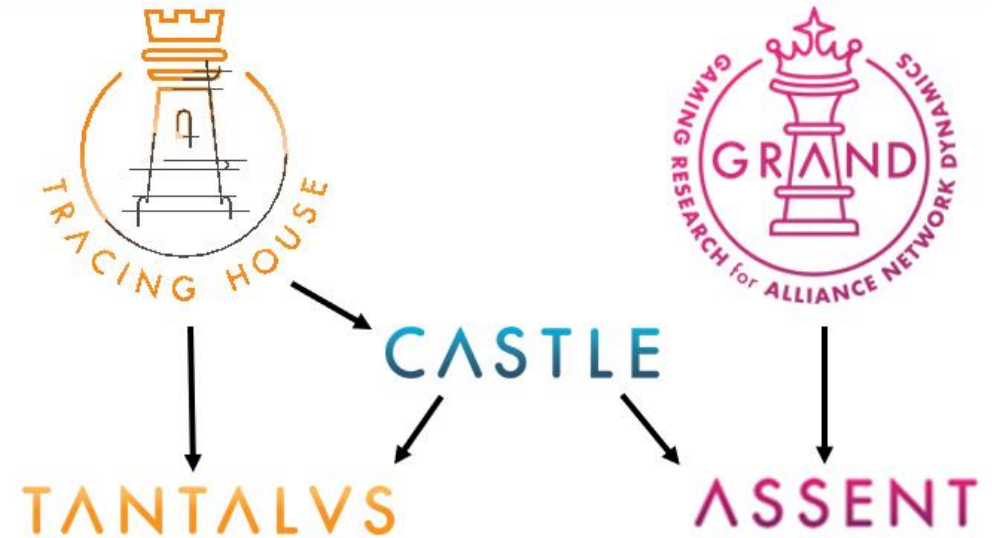
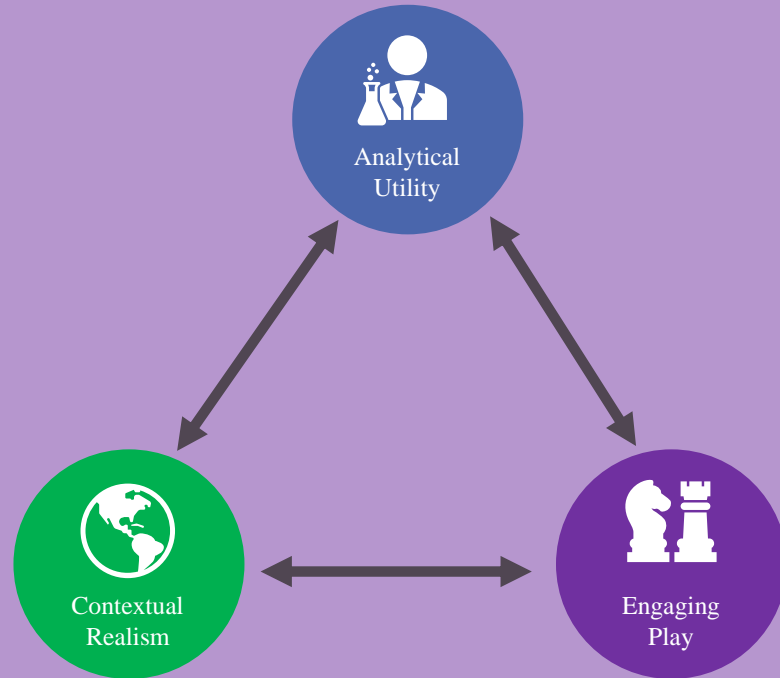
## I will not address

- Specific lines of nuclear strategic research
- Methodological superiority



# PAST AND ONGOING WORK

## The Wargame Designer's Trilemma



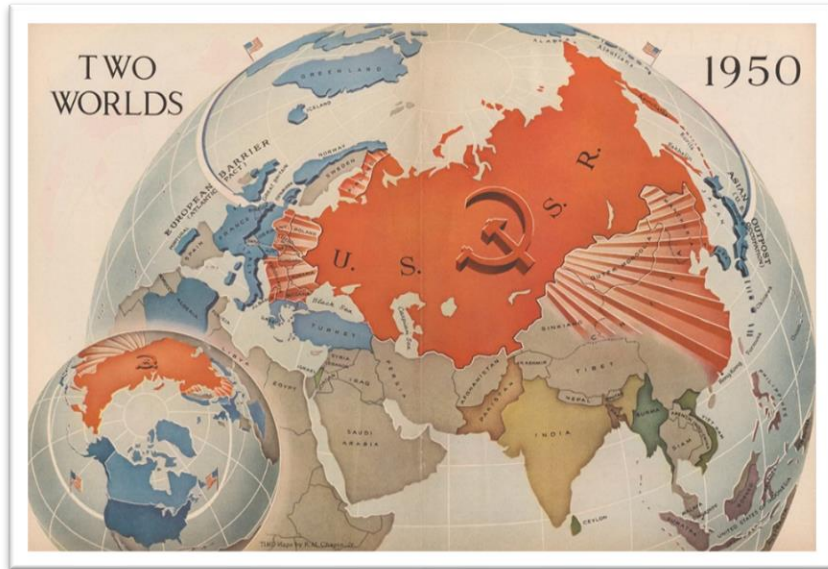
Any subjective views or opinions are my own and should not be construed to represent the views of the U.S. Department of Energy or the United States Government.

# Escalation and the Modern Context for Nuclear Conflict





# CHANGING NUCLEAR CONTEXTS



## Historical

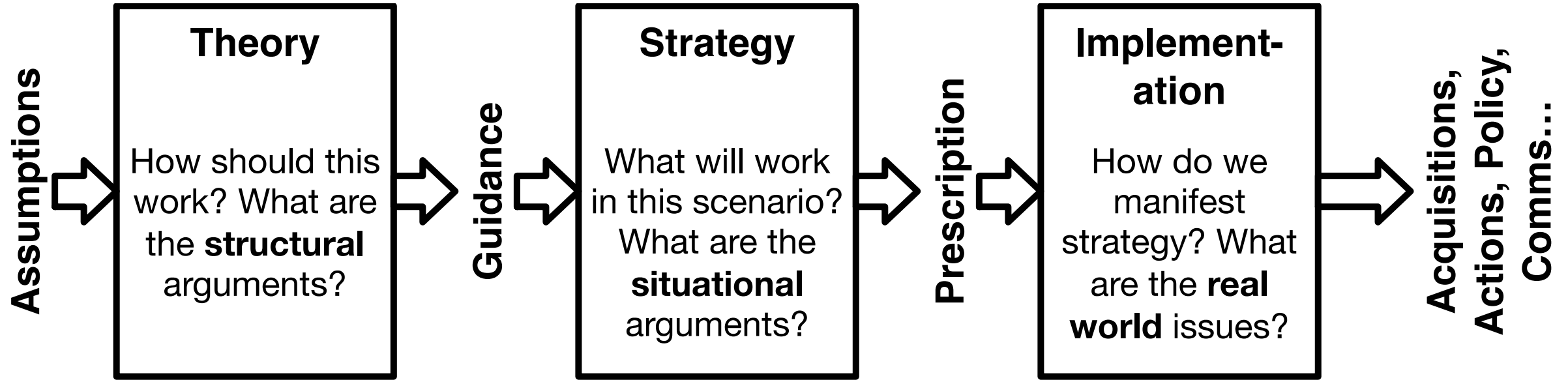
- A bi-polar world
  - Creation of Shared Norms
- Conventional versus Nuclear
- Primary focus on strategic-level weapons
- Presumed existential consequences

## Present

- Multi-polar world
  - New players
  - Lack of shared norms/taboo
- Multi-domain
  - Conventional/Cyber/Nuclear
- Some nations revisiting viability/utility of tactical weapons
- Changes to kinetic weapon capabilities



# Deterrence and Escalation Require Multiple Analytic Perspectives

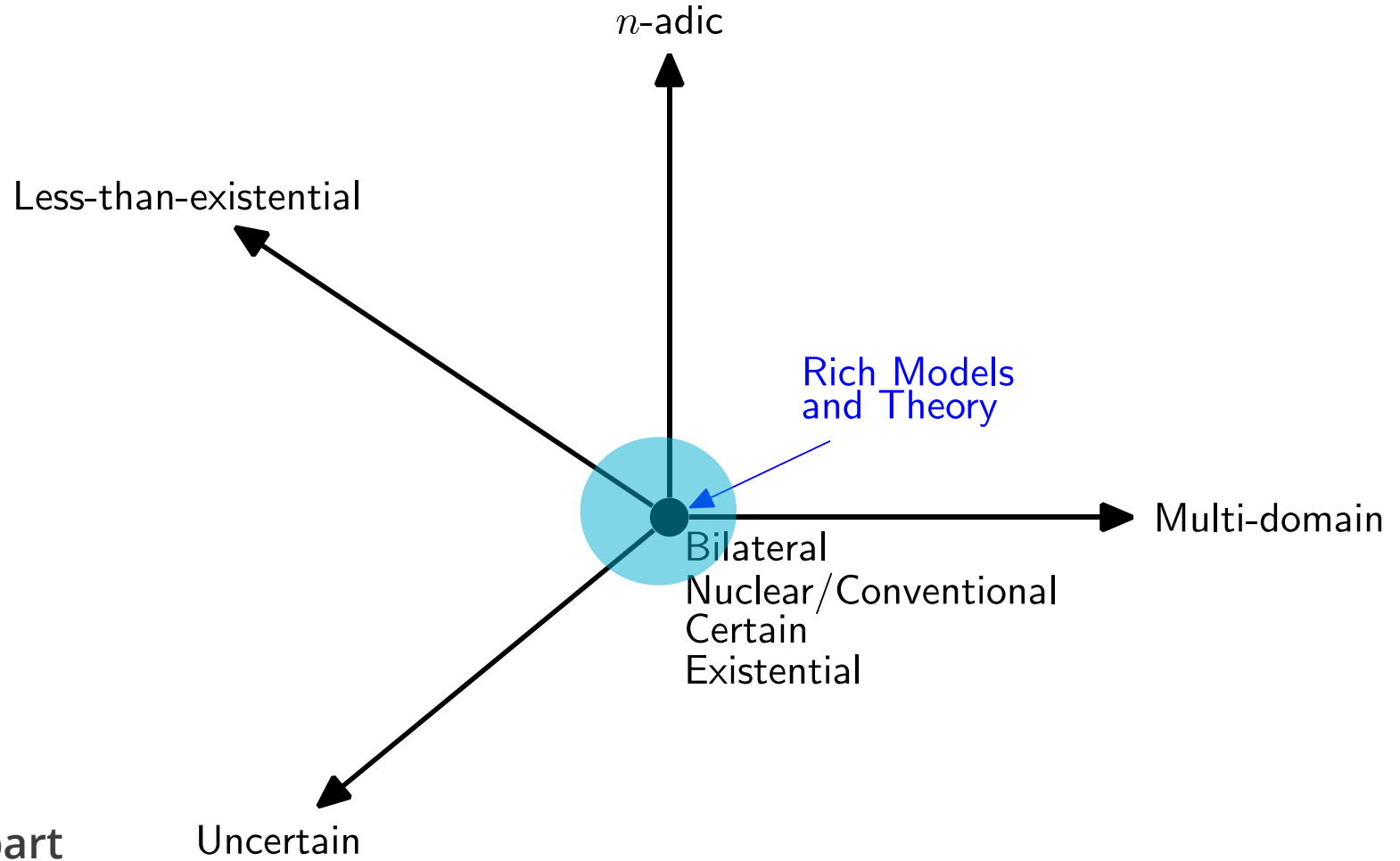
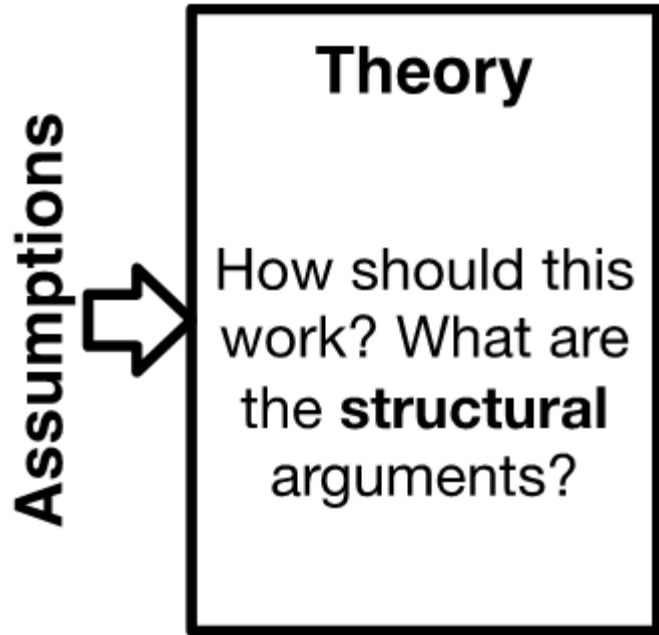


U.S.	Soviet Union	
	Wait	Strike ( $p$ )
Wait.....	$u_{11}, v_{11}$	$u_{12}, v_{21}$
Strike ( $q$ ).	$u_{21}, v_{12}$	—

Ellsberg, *The Crude Analysis of Strategy Choices*, 1961




# Need for New Theory for a New Age



Our understanding covers only small part of the scenario space we need to cover.



# GROWTH OF THEORY



	Discover	Describe	Explain	Anticipate	Influence
We seek to understand	A change...	Important interactions in the new world...	Why those interactions occur...	When and to what extent they occur...	How this be affected...
Research focus	Emergent Properties	Constructs	Relationships between constructs	Causal links, moderators, mediators	Impact of changes to variables on system





# DATA BUILDING BLOCKS FOR THEORY

## Primary Empirical

- Interviews
- Observations
- Surveys – factor analysis, variance models

## Secondary Empirical

- Historical records (after action reports, unit daily staff journals, and general order, etc.)
- Histories
- Re-purposed stats/documentation

## Generated

- Analytic Gaming including:
  - Tabletop Exercises (including BOGSATs) – insights, analysis, and other data
  - Exploratory wargaming – insights, analysis, and other data
  - Experimental (RCT) wargaming – variance and process models
- Modeling and Simulation



# THE COMPLEXITY-SCARCITY GAP

Decision makers often need insights about areas of conflict that are too complex to easily model and for which we lack robust data.

## Simple Strategic Models

- Two (or few) Actors
- Existential Stakes
- Binary Thresholds
- Assumption of "Lesser and Included" Cases

**CANNOT MODEL**



## Rich Empirical Data

- Many Relevant Historical Instances
- Available Data Sources
- Proxy Experimentation
- Crowds vs. Individuals

**HAS NOT HAPPENED YET**



# WARGAMES BRIDGE THE GAP

- Research question considers interaction between humans or groups of humans
- Data are scarce or data are saturated with confounds
- Actual interaction cannot be captured ethically
- Real world context can be somewhat abstracted

**Nuclear Weapon**  
Destroy multiple hexes.

**Electro-Magnetic Pulse Nuclear Weapon**  
Hex location determined by 100 roll die pattern (player's choice)

**High-Precision Low-Yield Nuclear Weapon**  
Destroy a single hex.

Location	Effect
Any hex adjacent	Destroy hex, including infrastructure and occupying forces, for remainder of the game.

**Build Military Base**  
Build military base on an open hex.

**Build Towns & Cities**  
Build a town in your state, or turn a town into a city.

Location	Requirements
Hex	Cannot contain resources
Territory	Owned

or



## USE WARGAMES TO

- **Discover** emergent behaviors
- **Describe** factors that seem to drive behaviors
- **Explain** how (and sometimes why) multiple factors interact
- **Anticipate** behaviors by developing models in an environment where we can measure and manipulate factors
- **Influence** factors in simulated environments to understand effects on conflict/collaboration as those factors change



# EXAMPLE RESEARCH QUESTIONS FOR THE FUTURE

## MULTI-POLAR

- What are the emergent behaviors of concern in a multi-polar nuclear world?
- Are nuclear norms shared across all nuclear actors? (e.g., do our signals mean the same things?)
- How might interactions between non-allied peers affect optimal signaling to maintain nuclear deterrence?
- How could nuclear de-escalation function in a multi-polar nuclear conflict?

## MULTI-DOMAIN

- How does the introduction of new conflict domains affect deterrence?
- How and to what extent do new domains escalate? How do they affect cross-domain escalation?

## ALL CHARACTERISTICS

- What conflict behaviors are likely given the values, goals, and resource constraints of peer actors given multi-polarity, multi-domain conflict?
- How can we influence conflict/collaboration behaviors in this new environment to secure optimal outcomes?

Questions?

—  
Thank you.

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