Interests, Interactions, Institutions and Game Theory

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Today's Class

- Interests, Interactions, Institutions
- Strategic Interaction
- Game Theory Primer

Central Question

How do we theorize and explain world politics?

Key terms

- Interests
- Strategic Interactions
- Institutions
- Rationality
- Cooperation
- Bargaining
- Prisoner's Dilemma
- Collective Action Problem

General Goal: Theory Development

- Political scientists develop **theories**: a logically consistent set of statements that explain a phenomenon of interest.
- **Good theories simplify complexity** to identify the most important factors in explaining that phenomenon.
- Goal is **probabilistic claims**: successful theories identify the factors that make something more or less likely.
  - Political scientists tend to avoid absolute claims, unlike theories from the physical sciences.

Theory Components

- **Actors**: the basic units of any analysis.
- What is the primary actor in IR?
  - The state.
- All actors have **interests**: the political goals and objectives they pursue; what they want to achieve in any given situation.

Interest Examples

Actor	Potential Interests
States	Security, power, wealth, ideology
Politicians	Remain in office, ideology, policy goals
Bureaucracy	Budget/influence maximization, policy goals
International Organizations	Reflects interests of member states, conditioned on their voting power and other sources of influence
Firms, industry groups	Wealth, profit
NGOs	Ideology, moral, policy goals
Voters	Income, security, ideology, moral, policy

Interactions

- Actors are not alone - their actions impact each other.
- **Interactions**: how the choices of two or more actors combine, producing political outcomes.
- These interactions can be **strategic**: each actor's strategy depends on what they anticipate other actors will do.
- Actors purposefully develop strategies that they believe will be the best response to the anticipated strategies of others.
- We'll come back to this shortly with game theory.

Institutions

- **Institutions**: a common set of rules shared amongst actors that structure interactions in specific ways.
- Examples?
  - UN
  - NATO
  - World Trade Organization
  - International Monetary Fund

Applying the Framework

- Identify the relevant actors and their interests
- Describe the choices or actions they must choose from
- Think about how those choices interact to produce outcomes
- Consider whether institutions structure the interaction

The Iraq War

Building up to the Iraq War

- Gulf War in 1991
- US- and UN-led sanctions throughout 1990s
- 9/11 and the War on Terror
- George W. Bush argues that Iraq has WMDs; does not get UN support for intervention
- March 2003: US invades Iraq with intent to overthrow the regime

The Iraq War

The Iraq War and its effects

- May 2003: Bush declares "mission accomplished"
- Insurgency continues throughout the 2000s
- January 2007: Bush pledges surge of troops to Iraq
- December 2011: Obama withdraws
- June 2014: Obama dispatches troops to respond to Islamic State
- December 2021: Roughly 2,500 US troops in Iraq in support roles

Casualties as of November 2019

Costs of War Project

- 4,572 US troops, 3,588 US contractors, est. 50,000 Iraqi military and police deaths
- Est. 37,000 opposition fighter deaths
- Est. 200,000 civilian deaths
- Economic cost: Nearly $2 trillion for the US alone

Group Discussions

- Who are the relevant actors?
- What are the actions they could have taken?
- How did the actions that they chose interact to produce outcomes?
- (How) did institutions structure the interaction?

Institutions and Anarchy

- But what about anarchy?
- Most states follow institutional rules most of the time. Why?
- Answering this requires answering a bigger question...

Interaction Types

What kind of interactions do we observe between actors?

Strategic Interactions

- Almost all of the interactions we discuss in this course are **strategic interactions**: Each actor's strategy depends on what strategy they anticipate other actors will use.
- Phrased differently, what one actor expects others to do shapes their own decision.
- Strategic interactions usually take place under **incomplete information**: any given actor does not know for certain what other actors will do or want.
- Thus, strategic interactions involve attempts by actors to successfully anticipate the actions of others.
- This gives rise to two fundamental different types of strategic interaction: **cooperation** and **bargaining**.

Game Theory

- We can analyze these strategic interactions through **game theory**: A mathematical way to model what two or more actors (people, states, groups, etc.) do when acting strategically.
- Game theory allows us to find stable outcomes that result from strategic interaction.
- Game theory assumes that all actors are **rational**.

Game Theory: Rational Actors

- A rational actor, by definition, has **complete**, **ordered**, and **transitive** interests (also called "preferences").
  - Complete: the actor has some kind of preference for all possible outcomes of a situation.
  - Ordered: we can rank those preferences in some way.
  - Transitive: if the actor prefers outcome A to B and B to C, they must prefer A to C.
- This assumption is not always descriptively accurate.
- But it is especially suited to studying politics.

Game Theory

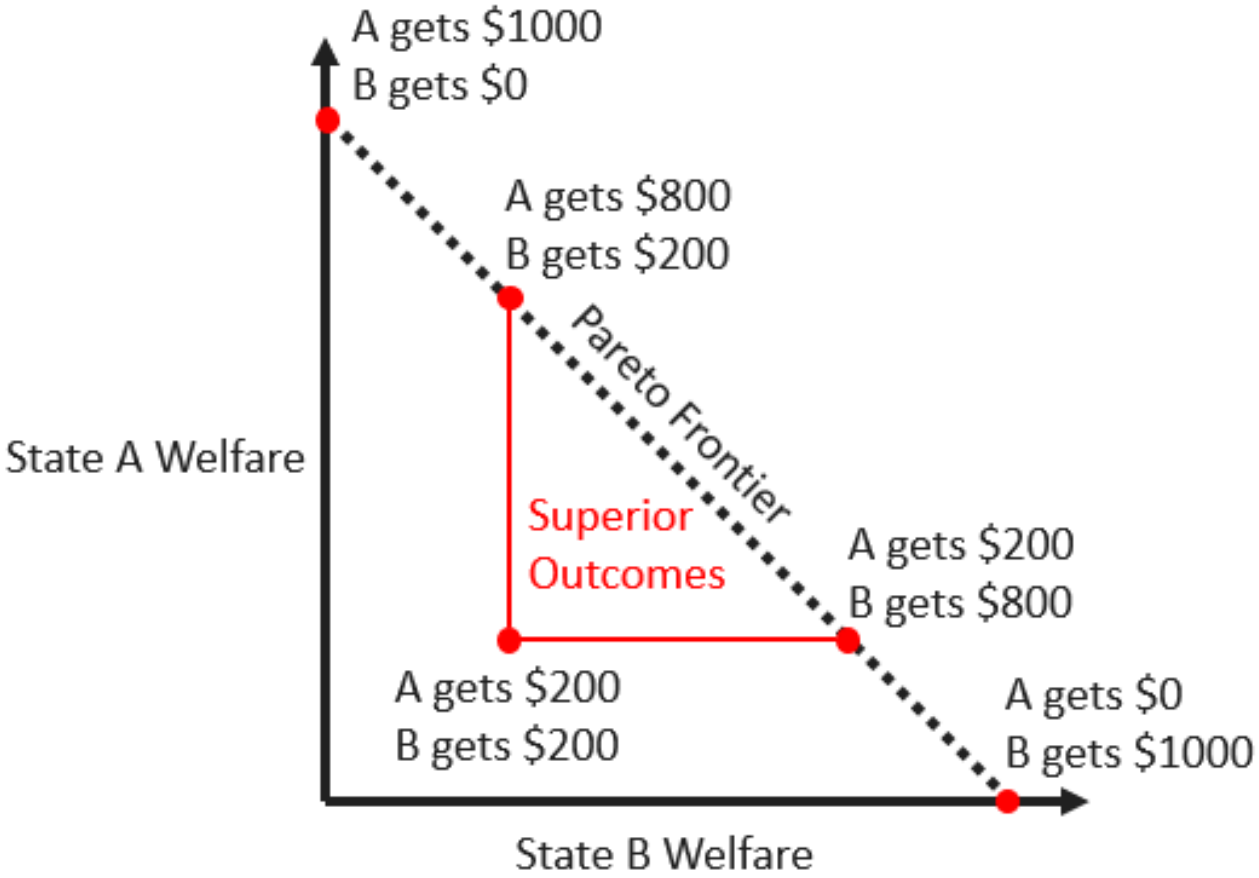
- Game theory lets us analyze both cooperation and bargaining.
- **In any game-theoretic analysis, we always assume all the actors are rational.**
  - If this assumption does not hold, game theory stops working.

Cooperation

Cooperation: an interaction in which two or more actors adopt policies that make at least one actor better off relative to the status quo without making others worse off.

- Also called positive-sum game.
- Cooperating actors are often able to reach the **Pareto Frontier**: The possible divisions of the maximum benefit for all actors.

Cooperation



Cooperation Types - Coordination

- **Coordination:** All actors will benefit from cooperating, and none have incentives to defect.
  - **Defect**: game theory term for an actor choosing the non-cooperative choice.
  - In coordination, actors have no incentive to defect.
- Example: driving on the same side of the road.
  - Everyone benefits from driving on the same side (fewer crashes).
  - No one has an incentive to defect (driving on the opposite side), since that will lead to a crash.
  - Coordinating on an outcome is generally more important than what that outcome is (ex: it doesn't matter which side of the road everyone drives on, as long as it's the same).

Cooperation Types - Collaboration

- **Collaboration:** Actors can gain from cooperating, but at least one has some incentive to defect.
- In IR, there are two important recurring collaboration scenarios: the **Prisoner's Dilemma** and **collective action problems**.

Prisoner's Dilemma Setup

- Imagine two suspected criminals are caught by the police.
- Police have evidence to charge each with a minor crime, but not a major crime, unless...
- Either suspect can provide the police with evidence of the other's involvement in that crime. If they do, while the other stays silent, they go free while the other gets a severe sentence.
- If both suspects provide evidence against the other, they each get a medium sentence because they helped the police secure their convictions.

Prisoner's Dilemma Setup

- Both suspects decide whether to stay silent (**cooperate**) or provide evidence against their accomplice (**defect**).
- No chance for communication, and decisions are made simultaneously.
- The outcome is created by their combined choices.
- The outcome for an actor is sometimes called their **payoff**.

Prisoner's Dilemma Outcomes

- $\{C,C\} \rightarrow$ each suspect goes to prison for 1 year
- $\{D,D\} \rightarrow$ each suspect goes to prison for 5 years
- $\{C,D\} \rightarrow$ suspect 1 goes to prison for 10 years; suspect 2 goes free
- $\{D,C\} \rightarrow$ suspect 1 goes free; suspect 2 goes to prison for 10 years

Solving the Prisoner's Dilemma

- Our goal is to find stable outcomes called *equilibria*.
- To do so, we must find each actor's *best response*.
- We can do this by using an actor's **utility function**: a function that numerically maps an actor's preferences to outcomes. Actors always want to maximize their utility functions.
- Each actor in the Dilemma has a similar utility function. $U(x) = x$ where x is the number of years in jail.
- We can conceptualize of years in jail as negative, so maximizing the function means finding the least negative number.

Prisoner's Dilemma Utility for Suspect 1

- $\{C,C\} \rightarrow$ each suspect goes to prison for 1 year
  - $U(x) = -1$
- $\{D,D\} \rightarrow$ each suspect goes to prison for 5 years
  - $U(x) = -5$
- $\{C,D\} \rightarrow$ suspect 1 goes to prison for 10 years; suspect 2 goes free
  - $U(x) = -10$
- $\{D,C\} \rightarrow$ suspect 1 goes free; suspect 2 goes to prison for 10 years
  - $U(x) = 0$

Solving the Prisoner's Dilemma

- To find the utility for suspect 2, repeat the previous slide but substitute in their sentence lengths instead of those for suspect 1.
- Once we have these amounts, they can be visualized in a table...

Prisoner's Dilemma

		Actor 2	
		C	D
Actor 1	C	1's payoff, 2's payoff	
	D		

Prisoner's Dilemma

		Actor 2: C	Actor 2: D
Actor 1	C	$-1, -1$	$-10, 0$
	D	$0, -10$	$-5, -5$

Prisoner's Dilemma

		Actor 2: C	Actor 2: D
Actor 1	C	$-1, -1$	$-10, 0$
	D	$0, -10$	$-5, -5$

Prisoner's Dilemma

		Actor 2: C	Actor 2: D
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Prisoner's Dilemma

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		Actor 2: C	Actor 2: D
Actor 1	C	$-1, -1$	$-10, 0$
	D	$0, -10$	$-5, -5$

Prisoner's Dilemma Equilibrium

- There is a unique equilibrium: both actors will defect.
- We know this because there's no unilateral deviation from choosing D that is profitable.
- Why can't the actors agree to cooperate given that each would be better off?
- **Each always has an incentive to defect!**

Prisoner's Dilemma in Politics

Despite its simple premise, the PD can be applied to important political examples:

- Nuclear (or conventional) arms races
- Striking first in a war
- Raising tariffs and other trade barriers

Collective Action Problems

- A similar logic also explains why large groups (of people or states) can struggle to provide certain public goods.
- **Public good**: a good that is nonexcludable and nonrival.
  - Ex: clean air, national defense, addressing climate change
- By definition, you cannot prevent someone from enjoying a public good, and the amount of that good that they "consume" does not decrease the amount available for others.
- What incentive does a rational actor have to pay the costs required to provide such a good?

Collective Action Problems

- None!
- By definition, a public good is one that is available to all, regardless of whether they helped provide it.
- Thus, every actor in a group has an incentive to **free-ride**: avoid paying the costs of providing the public good, while benefiting from its provision.
- If every actor thinks like that, what happens?
- The public good is under-provided or not provided at all.
- **This is the core of the collective action problem: all members of a group benefit from the provision of the public good, but all have incentives to "defect" by not helping pay the costs of providing the good, and so the public good is never provided.**

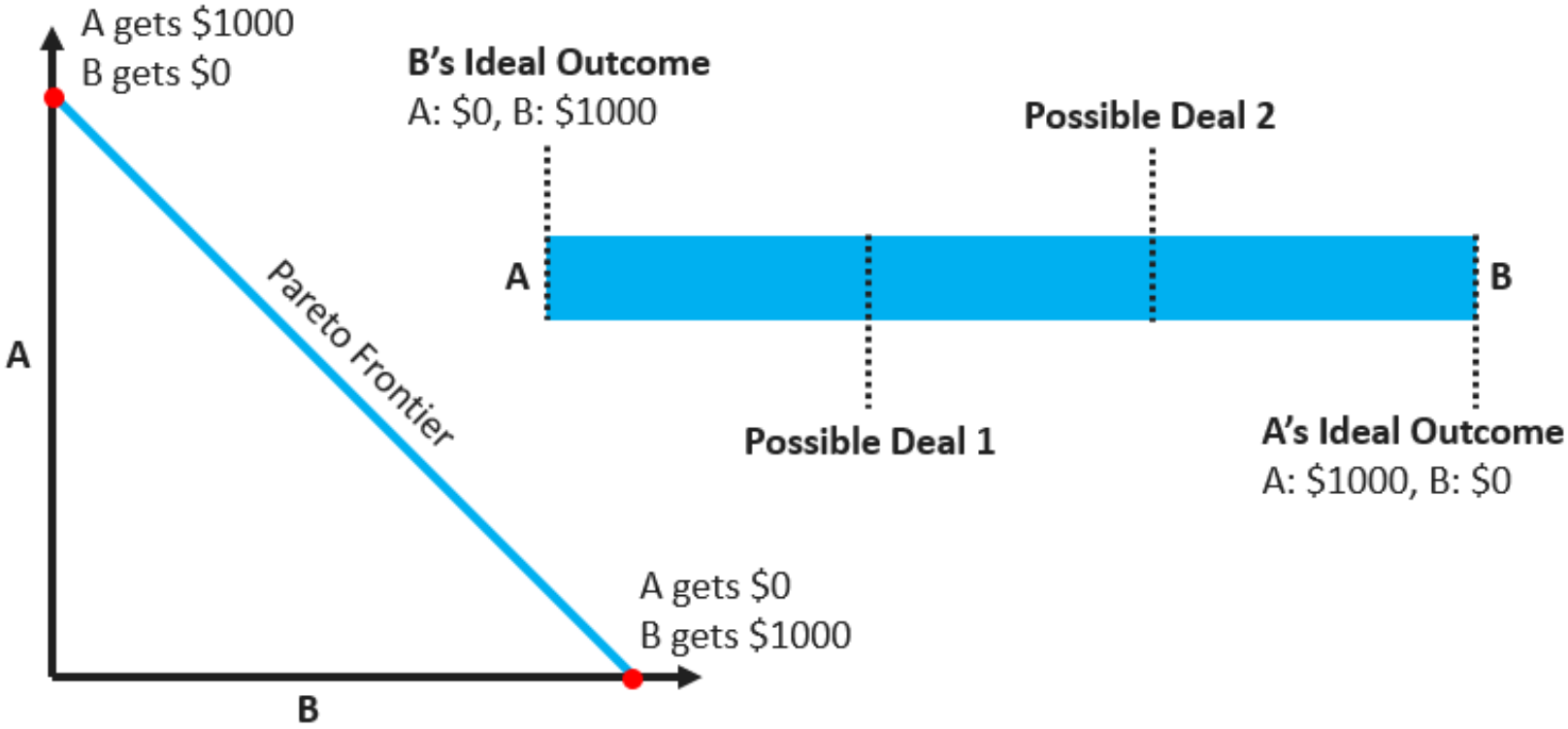
Brief Summary of Game Theory (So Far)

- Cooperation
  - Coordination
  - Collaboration
    - Prisoner's Dilemma
    - Collective Action Problems/Public Goods
- Bargaining

Bargaining

- **Bargaining**: an interaction in which two or more actors must choose outcomes that make one better off at the expense of the others.
  - Also called zero-sum game.
- Here, any gain for one actor always means a loss for another actor.

Bargaining


A gets $1000
B gets $0
A
Pareto Frontier
A gets $0
B gets $1000
B
B's Ideal Outcome
A: $0, B: $1000
Possible Deal 2
A
B
Possible Deal 1
A's Ideal Outcome
A: $1000, B: $0

Game Theory Implications for IR

- How can we encourage better outcomes for cooperation between actors? How can actors escape the trap of the PD and collective action problems?
  1. Number and relative size of actors
  2. Iteration
  3. Linkage
  4. Information

Number and Relative Size

- Easier for smaller number of actors to cooperate and monitor each other's behavior, preventing opportunities for defection.
- For public good provision, it may be in the interest of a relatively large member to provide the good for the group—if that member receives benefits sufficient to justify the entire costs.
  - Ex: National defense; US funding NATO

Iteration

- Cooperative outcomes are more likely when actors have repeated interactions.
- Why? Even if defection incentives exist in current interaction, if other actors withhold their cooperation in the future in interactions with "defectors", actors may be induced to cooperate by fear of losing future benefits.
  - Ex: Iterated Prisoner's Dilemma sees actors converge on cooperation.

Issue Linkage

- **Issue Linkage**: Tying cooperation in one policy area with cooperation in another area.
- "I'll cooperate here if you cooperate there."
- Differs from iteration as iteration focuses on the future, while this focuses on other policy areas in the present.

Information

- Providing information allows actors to coordinate their responses.
- Imagine the Prisoner's Dilemma, but both prisoners are in the same cell and can communicate...

Institutions and Anarchy Redux

- Recall the puzzle from earlier in class: Despite anarchy, most states follow institutional rules most of the time. Why?
- **Institutions enable cooperation by providing information, creating iteration, and enabling issue linkage.**
- In this way, institutions can facilitate cooperation that would have been unlikely without them.
- It is less costly to use existing institutions, even if imperfect, than to establish new ones.

Institutions and Anarchy Redux

How do institutions accomplish this?

- Setting standards of behavior
- Verifying compliance with rules and decisions
- Reducing the costs of joint decision making
- Selecting rules of interaction that make cooperation more likely

Even biased institutions can still be helpful in this regard.

Institutions and Policy Bias

AP Photo/Jose Luis Magana

Institutional Bias

- Example: the International Monetary Fund (IMF).
- The EU and the US each have enough votes within the IMF to veto any major decision by the organization.
- Many critics charge that the IMF, as a result, is biased in its policies toward the interests of the developed countries.
- Few (no?) institutions are wholly neutral.

Summary

- To develop theories of political behavior, we identify actors, their interests, how they interact, and how institutions structure those interactions.
- Most interactions are strategic interactions.
- We can analyze strategic interactions through game theory.
- Game theory requires that we assume actors are rational.
- This assumption yields interesting results: cooperation and bargaining in general, as well as the PD and collective action problems.
- International institutions can enable beneficial cooperative outcomes even in an environment of anarchy.