



## Dixit: Games of Strategy\*

### PART ONE: Introduction and General Principles

#### How to Think About Strategic Games

Textbook Chapter: Chapter 2

MobLab Game: (Keynesian) Beauty Contest

Key Teaching Points:

- Introducing this game at the beginning will pique curiosity. Introduce the students to some basic intuition, as we will come back to this game more formally and in-depth in Chapter 5.
- Requires students to use strategic thought to make judgements about the choices others are making and how those choices will impact the individual's payoffs.

### PART TWO: Fundamental Concepts and Techniques

#### Games with Sequential Moves

Textbook Chapter: Chapter 3

MobLab Game: Ultimatum (available in either gameplay or strategy method)

Key Teaching Points:

- Students are introduced to backward induction and the concepts of fairness and altruism.

MobLab Game: Centipede

Key Teaching Points:

- The concept of backward induction is further reiterated to students with this game since students must use deductive reasoning to determine the next optimal move given the move in the subsequent turn.
- Students are introduced to Subgame Perfect Nash Equilibrium and the weaknesses in common rationality.

#### Simultaneous-Move Games: Discrete Strategies

Textbook Chapter: Chapter 4

MobLab Game: Stag Hunt

Key Teaching Points:

- Coordination is introduced as a potential risk in this game. Students may fail to coordinate to achieve efficiency if the social optimum creates risk for the player. Coordination failure can be brought to students' attention when a game is in a one-shot interaction form.

#### Simultaneous-Move Games: Continuous Strategies, Discussion and Evidence

Textbook Chapter: Chapter 5

MobLab Game: (Keynesian) Beauty Contest

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\* 5<sup>th</sup> edition.

#### Key Teaching Points:

- When introducing students to the game again in this chapter, the game can be used to demonstrate iterative logic and forecasting.

#### MobLab Game: Bach or Stravinsky; Minimum Effort

#### Key Teaching Points:

- Show students that miscoordination is common when different students disagree on a preferred strategy. If you choose to repeat the game with the same student pairs, students will begin to see patterns of fair and efficient behaviors.

## Combining Sequential and Simultaneous Moves

Textbook Chapter: Chapter 6

MobLab Game: Stackelberg Competition

#### Key Teaching Points:

- Highlights how sub-game perfect Nash equilibrium can be found with backwards induction.
- Shows the advantages of the first mover.

#### MobLab Game: Cournot

#### Key Teaching Points:

- Students are introduced to the concept of collusion and simultaneous actions by other market actors.

## Simultaneous-Move Games with Mixed Strategies

Textbook Chapter: Chapter 7

MobLab Game: Matching Pennies (1 round, 2 players); Rock, Paper, Scissors; MinMax (Zero-Sum Matrix)

#### Key Teaching Points:

- Demonstrates mixed-strategy equilibrium where players are willing to play a combination to make the other indifferent.

#### MobLab Game: Hide and Seek (Focal Points)

#### Key Teaching Points:

- Each student must randomize locations when seeking and hiding in this Nash equilibrium.
- Highlights how framing and context may change the importance of different choices.

## PART THREE: Some Broad Classes of Strategies and Games

### Strategic Moves

Textbook Chapter: Chapter 8

MobLab Game: Matching Pennies (1 round, 2 players); Rock, Paper, Scissors; MinMax (Zero-Sum Matrix)

#### Key Teaching Points:

- Demonstrates mixed-strategy equilibrium.

MobLab Game: Bach or Stravinsky; Minimum Effort

Key Teaching Points:

- Can be used to demonstrate multiple equilibria.

MobLab Game: Ultimatum (available in either gameplay or strategy method)

Key Teaching Points:

- Highlights different strategic preferences of justice and offer/rejection consistency.

## Uncertainty and Information

Textbook Chapter: Chapter 9

MobLab Game: Bomb-Risk Game

Key Teaching Points:

- Demonstrates that there is no one single answer for an individual's tolerance for risk.
- Allows students to develop their own risk preferences when playing the game, depending on how many boxes they choose to open.

MobLab Game: Herding (Information Cascade)

Key Teaching Points:

- Illustrates that in a social environment, students may use the rationale of following the herd and entering an information cascade.
- Opens discussion for how students weighted public vs. private information within the game.

MobLab Game: Principal Agent; Insurance Market; Lemon Market

Key Teaching Points:

- Students will learn that the information environment impacts how optimal a contract can be.
- Highlights the constraints that asymmetric information can put on a market.
- Introduces how differences in information can lead to adverse selection if one side of the market cannot observe the other side of the market.

MobLab Surveys: Ambiguity Aversion; Risk Preferences (Holt Laury); Risk Preferences (Binswanger);

Allais Paradox

Key Teaching Points:

- Allows you to check for student understanding or introduce them to a concept before a game is played.
- Relates to topics about ambiguity, risk, and rationalizing choices.

## The Prisoners' Dilemma and Repeated Games

Textbook Chapter: Chapter 10

MobLab Game: Prisoners' Dilemma (available in either matrix form or a gamified push and pull form)

Key Teaching Points:

- Demonstrates that repetition encourages cooperation amongst students.

- Introduces Nash equilibrium within the prisoners' dilemma with defect as the dominant strategy.

MobLab Game: Matrix: Instructor Specified

Key Teaching Points:

- Allows more flexibility when designing payoff matrices to teach a specific objective within Nash equilibrium and the Prisoners' Dilemma

## Collective-Action Games

Textbook Chapter: Chapter 11

MobLab Game: Multilateral Bargaining; Externalities (Judge Me Not)

Key Teaching Points:

- Introduces students to inconsistencies between individual and collective priorities.
- Demonstrates the importance of organizing coalitions to prevent majority rule leading to unequal resource distributions.

MobLab Game: Public Good: Punishments & Rewards; Tragedy of the Commons; Commons: Fishery

Key Teaching Points:

- Demonstrates that relying on voluntary contributions will not reach the efficient level of goods provision.
- Highlights that public goods are often subject to overuse because of individual incentives (tragedy of the commons).

## Evolutionary Games

Textbook Chapter: Chapter 12

MobLab Game: Trust

Key Teaching Points:

- Demonstrates that positive reciprocity can evolve if individuals anticipate the other player will also be altruistic.

## PART FOUR: Applications to Specific Strategic Situations

### Brinkmanship: The Cuban Missile Crisis

Textbook Chapter: Chapter 13

MobLab Game: Prisoner's Dilemma (available in either matrix form or a gamified push and pull form)

Key Teaching Points:

- Demonstrates to students the possibility of mutually assured destruction.

MobLab Game: Bach or Stravinsky

Key Teaching Points:

- Introduces students to the possibility of miscoordination in one shot games as opposed to repeated games.

## Incentive Design

Textbook Chapter: Chapter 14

MobLab Game: Public Goods: Punishments & Rewards; Principal-Agent

Key Teaching Points:

- Highlights that the incorporation of rewards and punishments may incentivize individual actors to voluntarily contribute to public goods.
- Students learn about incentive compatibility constraints.

## Auctions, Bidding Strategy, and Auction Design

Textbook Chapter: Chapter 15

MobLab Game: Auctions (English & Sealed Bid): First-price private value, Common value, and All-Pay; Ascending & Descending Clock Auction; Display Ad Auction; Competitive Market (Continuous Double Auction)

Key Teaching Points:

- If the auction games are played in conjunction with other auction games, students will be introduced to the difference in optimal bidding strategies based on the context.
- Demonstrate the differences between a variety of auction types and how to achieve bidding equilibrium in each type.

## Strategy and Voting

Textbook Chapter: Chapter 16

MobLab Game: Two-Candidate Election; Voter Paradox (1 Candidate); Voter Turnout (2 Candidates)

Key Teaching Points:

- Illustrates spatial voting models and associated equilibriums within the median voter theorem.
- Demonstrates the paradox of voting depending on the different effects that influence voting (competition effect, size effect, etc.).

## Bargaining

Textbook Chapter: Chapter 17

MobLab Game: Dictator; Trust; Bargaining: Alternating Offer, Multilateral; Ultimatum (available in either gameplay or strategy method)

Key Teaching Points:

- Highlights the role of other-regarding preferences in bargaining.
- Demonstrates the asymmetry that may arise when there is a two-party negotiation.