Outwit, Outplay, Outlast

Game-Based Learning through Survivor

UNIVERSITY OF NOTRE DAME | COLLEGE OF SCIENCE

Welcome

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Outwit, Outplay, Outlast

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The Dynamics of Survivor

Mathematical
Game Theory

Social Cognitive
Neuroscience

4 Core Course Components

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Mathematical Games

Mathematical Games

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Classical Introduction

Theoretical "Games"

- Eg. Prisoner's Dilemma

	Quiet	Confess
Quiet	(-1,-1)	(-10,0)
Confess	(0,-10)	(-5,-5)

Definitions and Theorems

Definition: Strategy (Action) X **strictly dominates** Strategy (Action) Y for a player if Strategy X provides a greater outcome than Strategy Y regardless of what the other player is doing.

4 Core Course Components

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Mathematical Games

Neuroscience Readings

Neuroscience Readings

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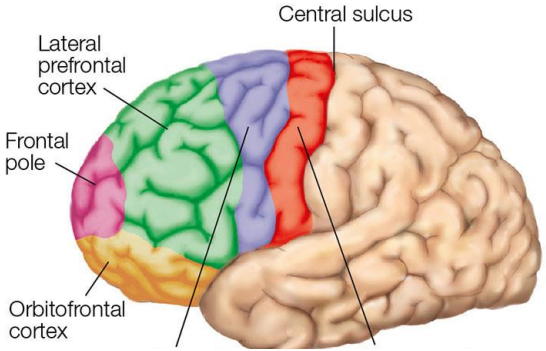
Background Knowledge



Related Papers

The Importance of the Lateral Prefrontal Cortex for Strategic Decision Making in the Prisoner's Dilemma

Alexander Soutschek [1,2] · Marian Sauter [1,3] · Torsten Schubert [1]

4 Core Course Components

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Mathematical Games

Neuroscience Readings

Episode Analysis

Survivor

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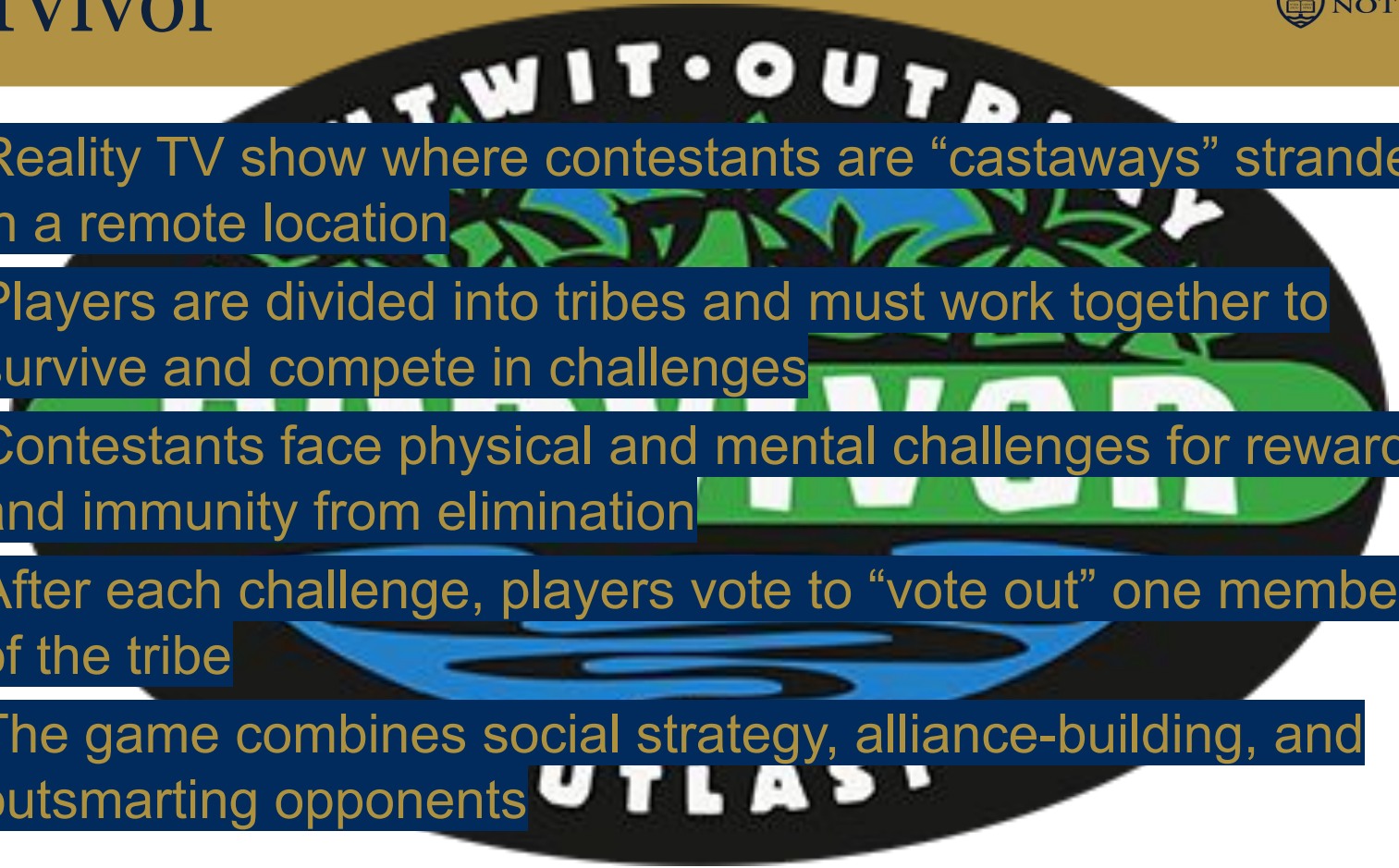

Reality TV show where contestants are “castaways” stranded in a remote location

Players are divided into tribes and must work together to survive and compete in challenges

Contestants face physical and mental challenges for rewards and immunity from elimination

After each challenge, players vote to “vote out” one member of the tribe

The game combines social strategy, alliance-building, and outsmarting opponents

4 Core Course Components

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Mathematical Games	Neuroscience Readings
Episode Analysis	In Class Game

In Class Game

The class played an adapted version of Survivor.

After each day they needed to analyze their own experiences in our “in-class game.”

- Daily Task: Record a video diary.
- Pre-Merge research paper
- Post-Merge research paper

Class Challenge Example

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Rules

- You each are a representative from your Tribe and you have to decide to work with the other person or try to get an advantage for your Team.
- Each person must choose between two options: **Attack, Trade, or Tariff**

Class Challenge Example

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Rules

- If both of you **ATTACK**, then you both lose 3 points
- If you **ATTACK** and the other **TRADES**, then you gain 10 points, and the other loses 5 points
- If you **ATTACK** and the other **TARIFFS**, then you gain 2 points, and the other loses 2 points
- If both of you **TRADE**, then you both gain 5 points
- If both of you **TARIFF**, then you both gain 2 points
- If you **TRADE** and the other **TARIFFS**, then you lose 2 points, and the other gains 7 points

Immunity Challenge

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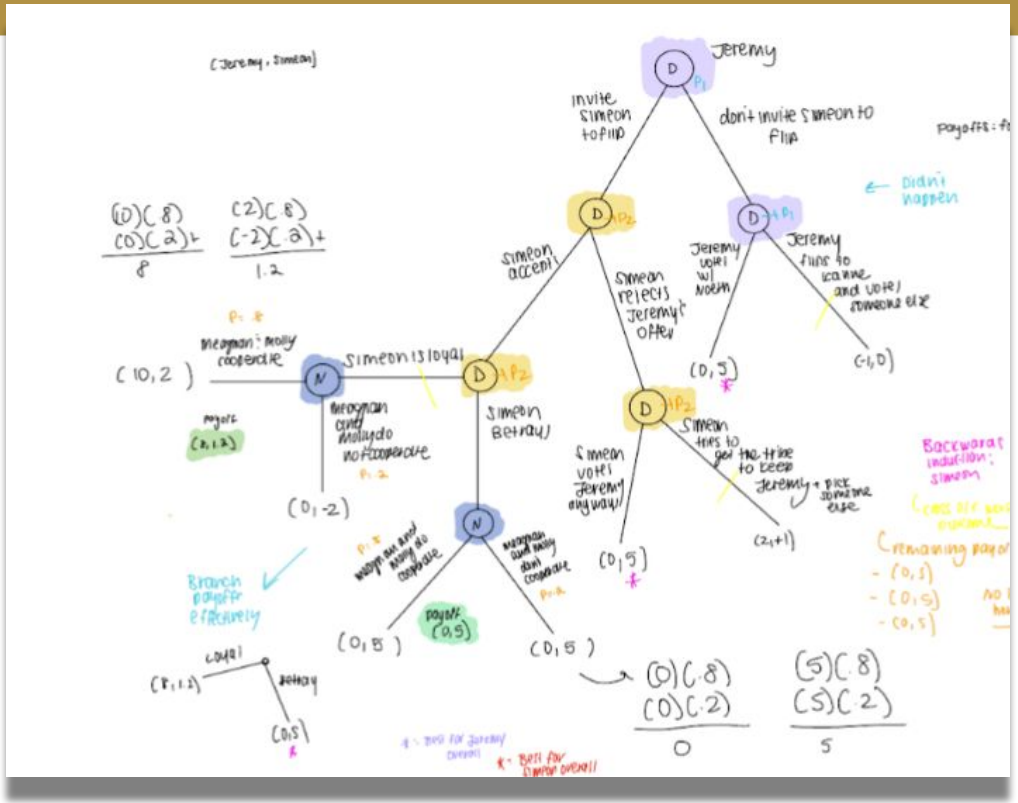
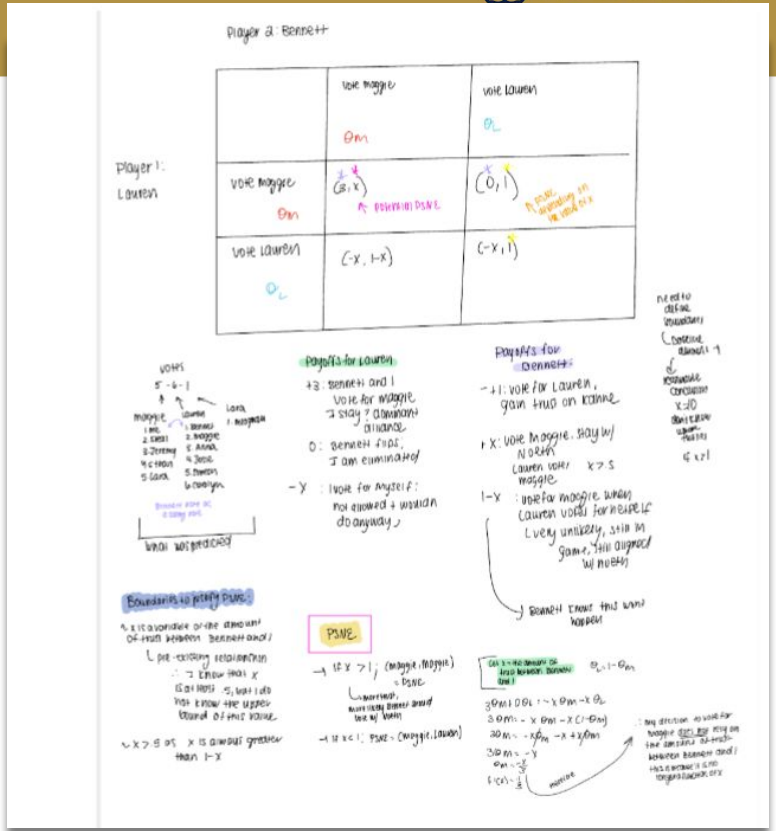
Let's Play

- Each of you select secretly either **ATTACK**, **TRADE**, or **TARIFF.**
- Write it down on a piece of paper and keep it face down.
- On the count of three, both of you reveal your choices simultaneously.
- We will tally the scores and the team with most points wins **Immunity**.

In Class Game





4 Core Course Components

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Mathematic

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adings

An Integrated Learning Experience

Episode Analysis

lass Game

Student Experiences

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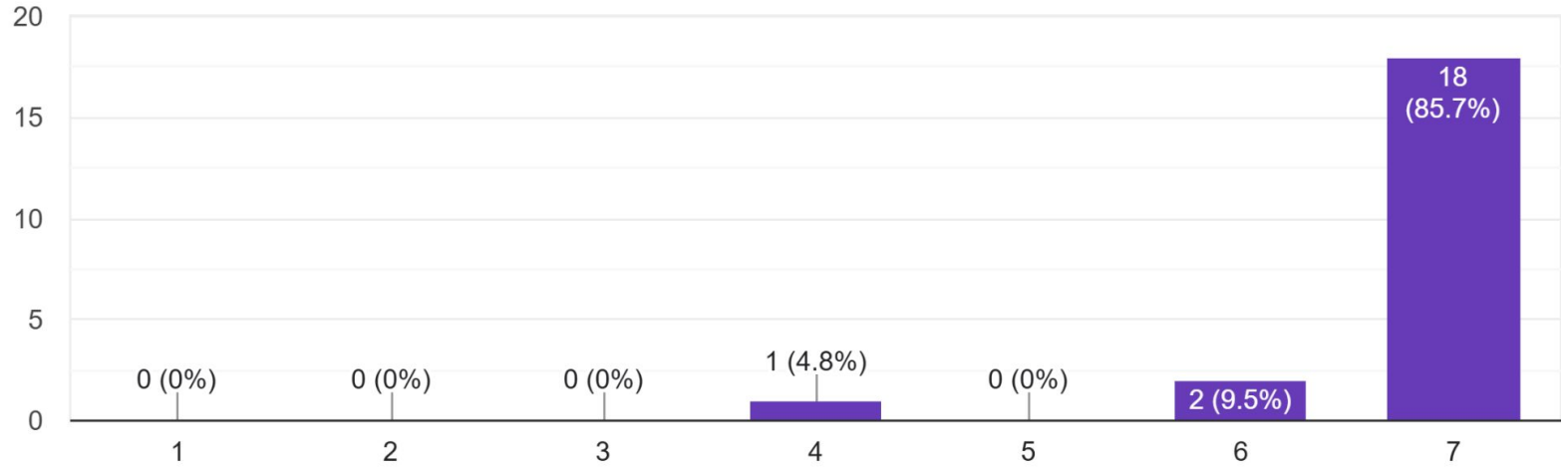
Using Survivor as a medium showed me that mathematics and psychology can come together to explain complex real-life situations.

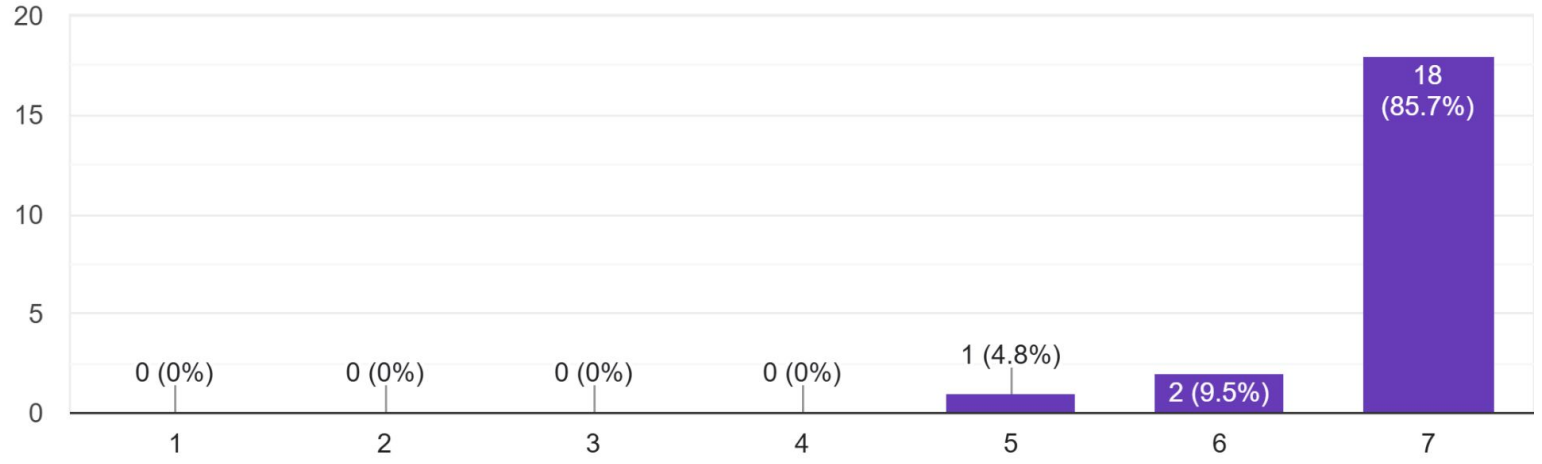
21 responses



Student Experiences

Playing a game of Survivor throughout the semester provided examples of the concepts we discussed in class.

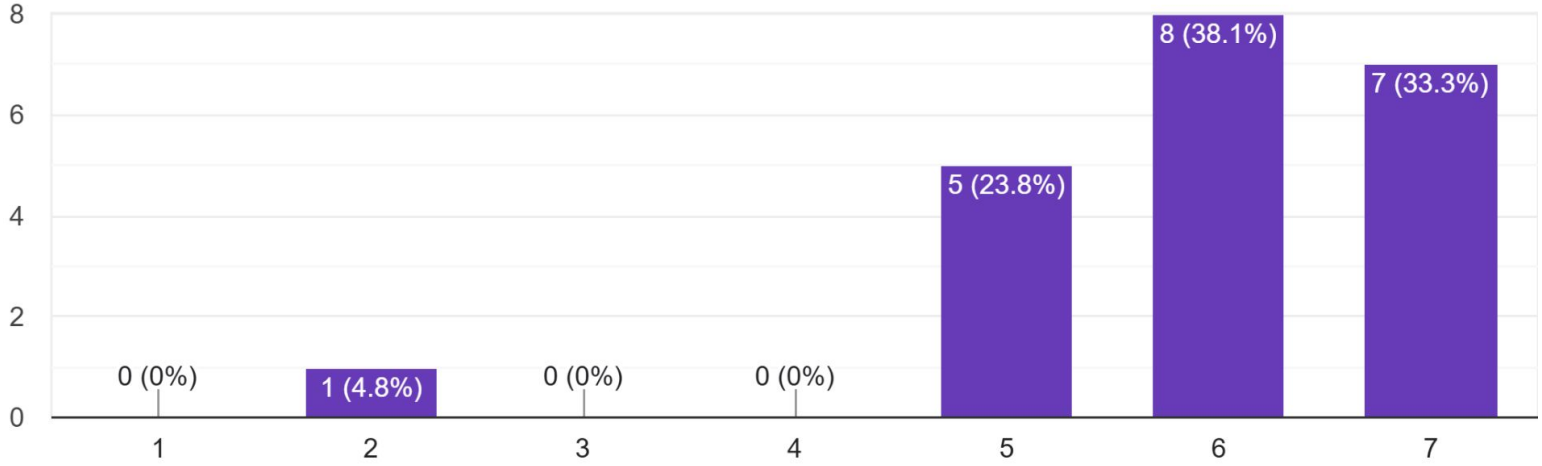
21 responses



Student Experiences

How confident do you feel now in abstracting a real-world scenario (e.g., a negotiation, a competition) into players, strategies, and payoffs using mathematical language?

21 responses



Student Testimonials

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Student 1

Playing the game allowed me to integrate myself into the material and offered a new perspective that would be absent if there was no **interactive component**. It was a great opportunity to be pushed socially and to **implement the material** we were learning to try to maximize individual success while understanding one's values and priorities.

Student Testimonials

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Student 2

Additionally, playing the game made me push through almost anything to **make sure I actually attended class** because I enjoyed it so much

Student 3

This class didn't just teach strategy, it was strategy. Every interaction had weight, every choice had consequences, and somehow in the middle of all the chaos, we learned how our brains actually handle uncertainty, emotion, and decision-making.

Conclusion

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Experience & Engagement	Social Dynamics & Personal Growth	Skills & Outcomes
• Fun • Exciting • Engaging • Innovative • Memorable • Challenging • Hands-On • Interactive • Unforgettable		

Conclusion

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Conclusion

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Thank You

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