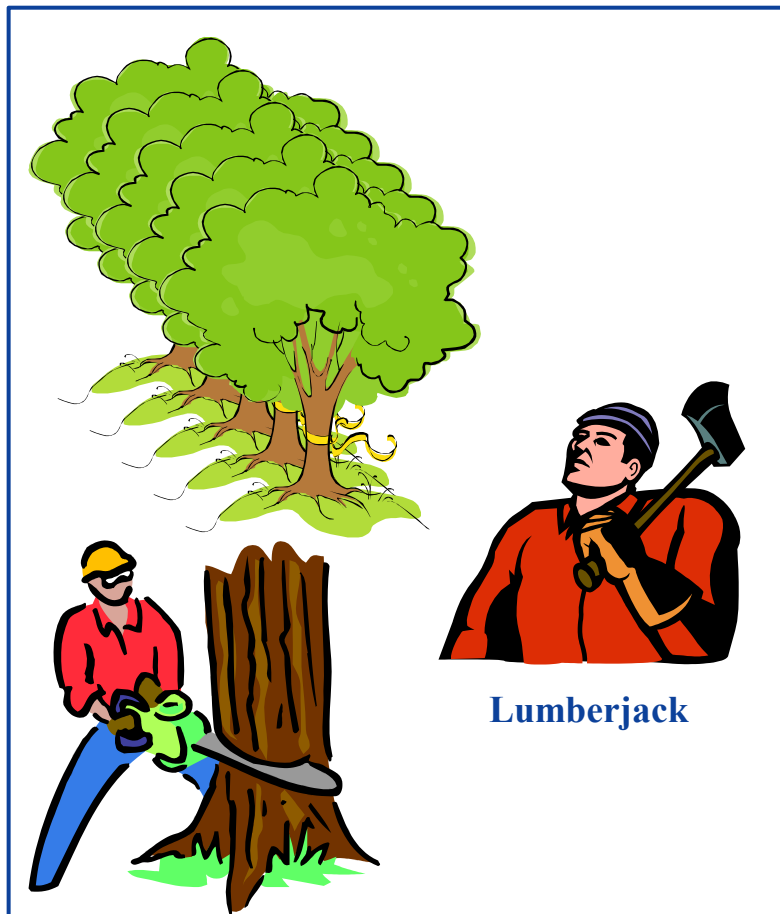

**Thinking Strategically:
Psychology, Economics,
and Experiments**

How we discuss Thinking Strategically : An Overview

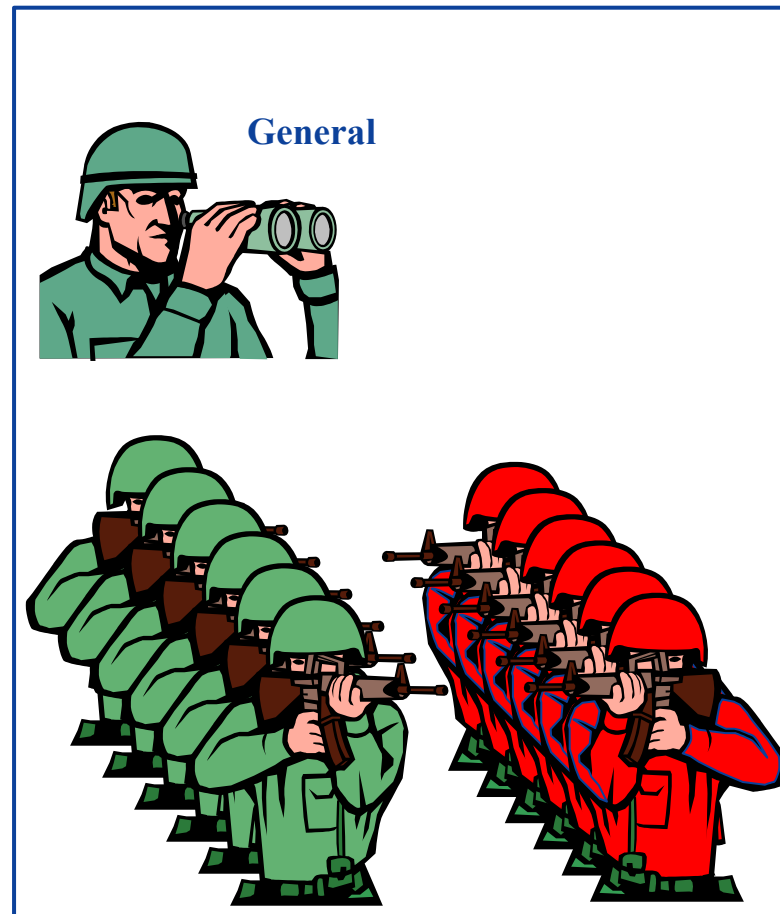
- **Case study: The scarf experiment and the role of abstraction**
- **What Game Theory is about**
- **Our course outline**
- **How we apply Thinking Strategically**
- **Your experiments**
- **How to conduct an experiment**
- **Further course information**
- **How you benefit from this course**

What game theory is about: Decision making in interactive situations

Isolated decision making



Interactive decision making



What is an interdependent decision making situations? A casual definition of games



Definition: A game consists of the following elements:

- 1. Players:** Who are the parties involved?
What aims are pursued by these parties?
- 2. Timing of moves:** Who acts when?
- 3. Actions:** What actions are available to a party at each of his/her moves?
- 4. Information:** What information is available to the players when they move?
- 5. Payoffs:** What are the payoffs associated with each possible outcome?

How we model the scarf experiment as a game: Its essential elements



1. Players:

- Eight students from this course

2. Timing of moves:

- Sequentially

3. Actions:

- To move to another positions, or not to move

4. Information:

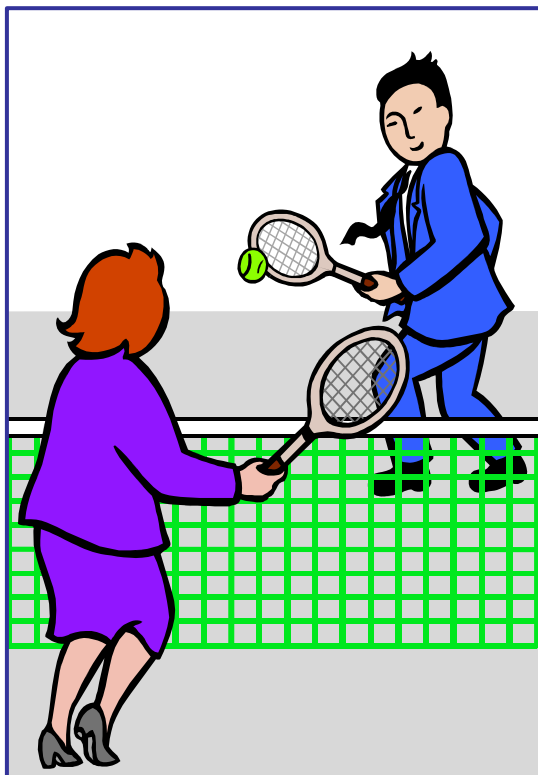
- Each player knows the color of his own scarf as well as the ones of all other players
- Each player knows the payoffs of all players

5. Payoffs:

- Each player wins one bag of jellies babies if at least one of his neighbours wears the same coloured scarf as he, otherwise nothing

How to behave in a game: Think strategically - some examples

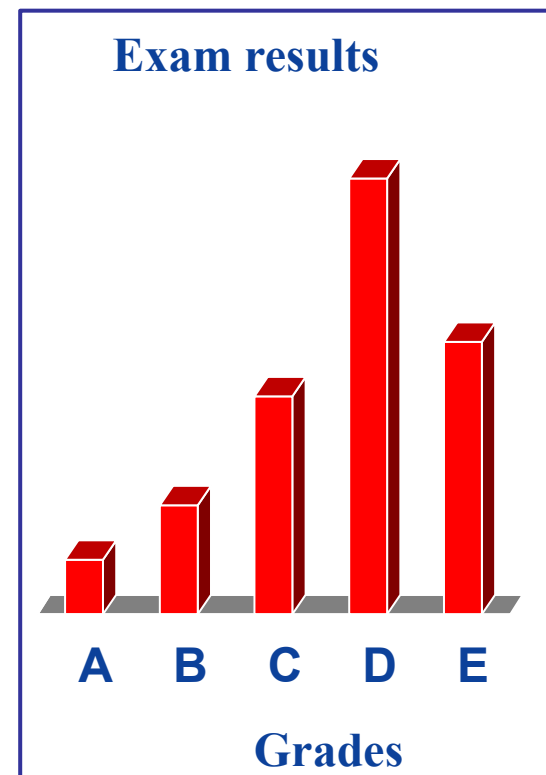
Down-the-line oder crosscourt?



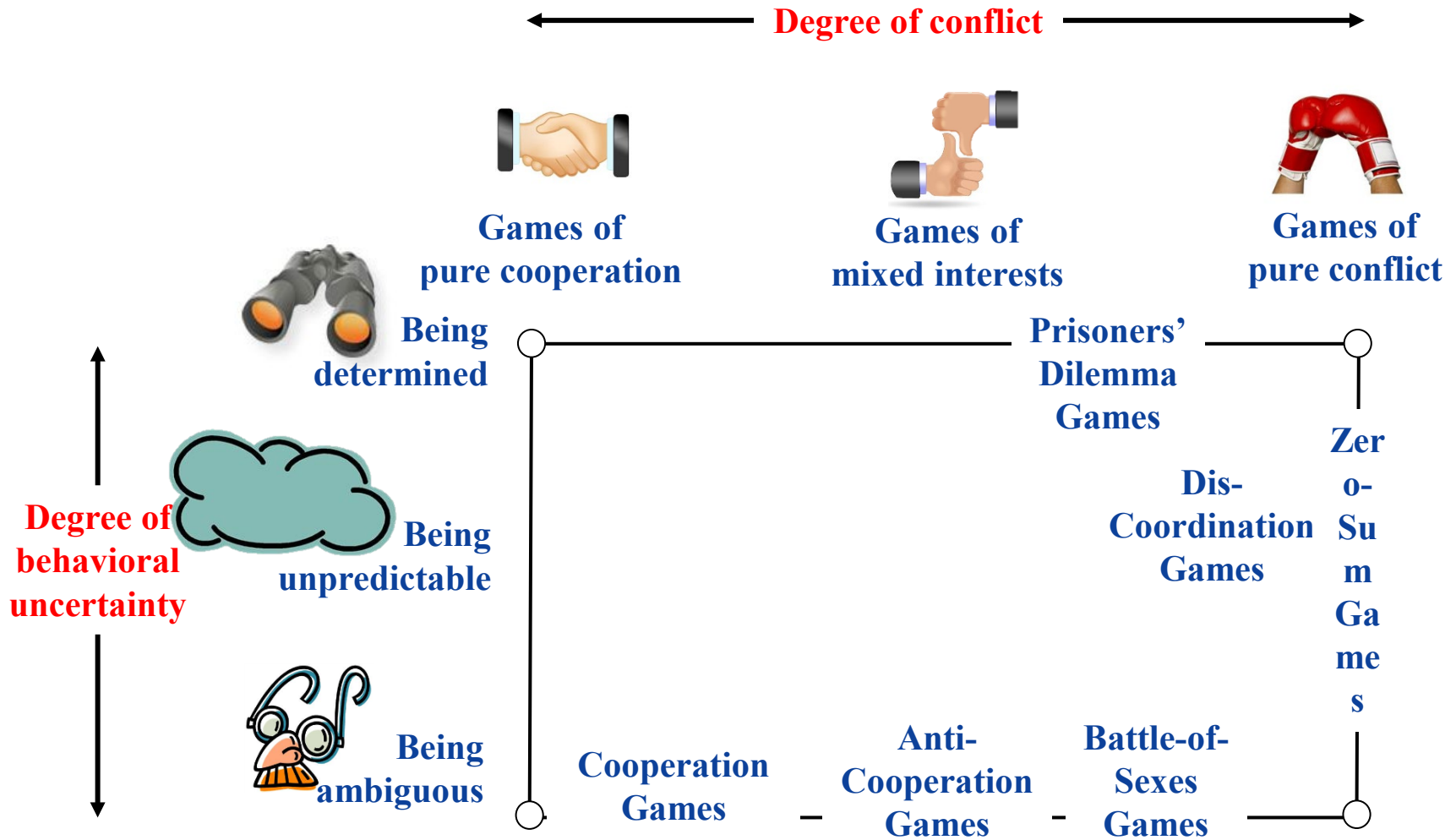
Are professors actually kind-hearted?



High grades for everybody?



Our path to discuss Fun & Games: Topics of this course



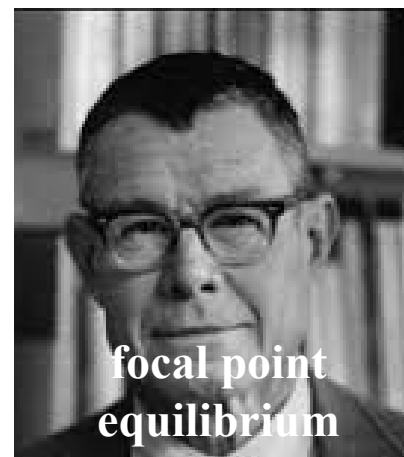
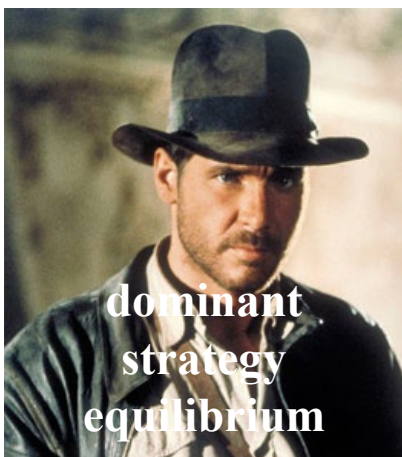
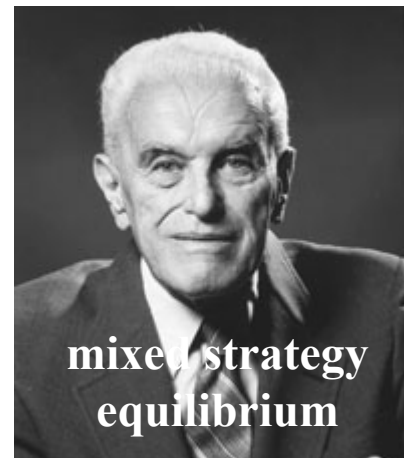
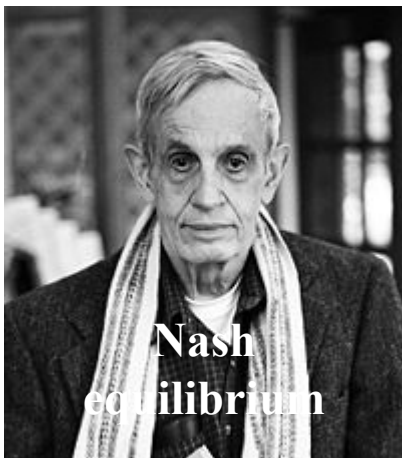
Our path to discuss Fun & Games: Course overview

Session 1 Theory of Games & Moves	Session 2 Prisoner's Dilemma Games	Session 3 Dis-coordination Games	Session 4 Zero-Sum Games	Session 5 Battle of Sexes Games	Session 6 Anti- & Coordination Games
Introductory Lecture	Theory	Theory	Theory	Theory	Theory
Theory	Experiment 1	Experiment 3	Experiment 5	Experiment 7	Experiment 9
	Experiment 2	Experiment 4	Experiment 6	Experiment 8	Experiment 10
Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	

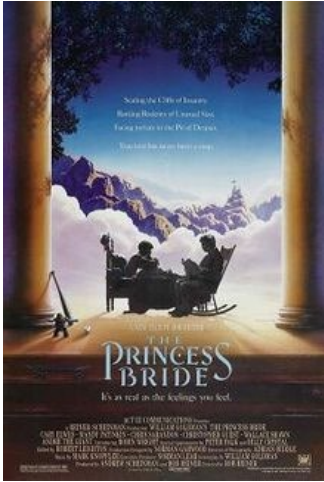
Our path to discuss Fun & Games: Course overview

Session 1 Theory of Games & Moves	Session 2 Prisoner's Dilemma Games	Session 3 Dis-coordination Games	Session 4 Zero-Sum Games	Session 5 Battle of Sexes Games	Session 6 Anti- & Coordination Games
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	Experiment 2	Experiment 4	Experiment 6	Experiment 8	Experiment 10
Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	

Thinking Strategically: Concepts we discuss



How we apply Thinking Strategically: Movies we discuss



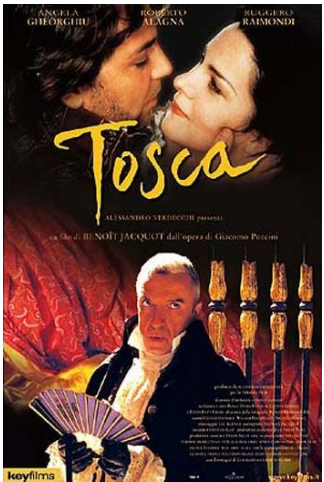
Film poster for The Princess Bride, retrieved from en.Wikipedia.org, copyright 1987, 20th Century Fox



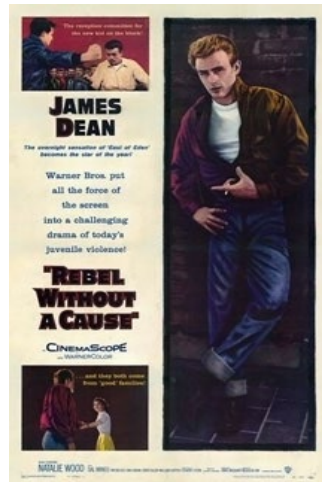
Film poster for The Gift of the Magi, retrieved from imdb.com, copyright is believed to belong to RHI Entertainment



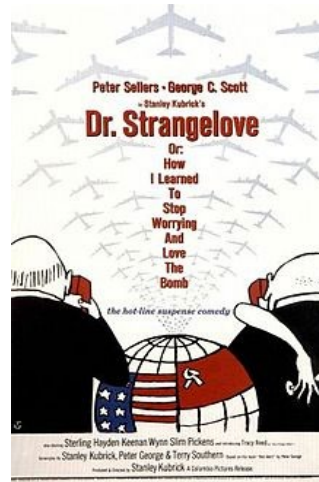
Film poster for Indiana Jones and the last crusade, retrieved from en.Wikipedia.org, copyright belong to Paramount Pictures



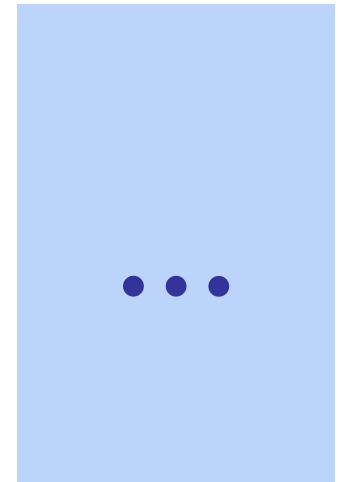
Film poster for Tosca, retrieved from en.Wikipedia.org, copyright is believed to belong to keyfilms



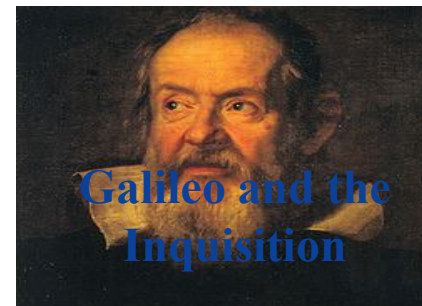
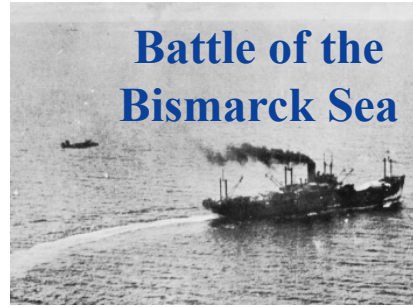
Film poster for The Gift of the Magi, retrieved from en.Wikipedia.org, © 1955 Renewed 1983 Warner Bros. Entertainment Inc



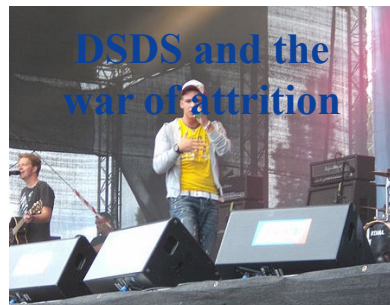
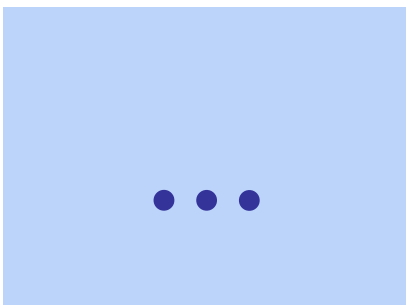
Film poster for Dr. Strangelove, retrieved from en.Wikipedia.org, copyright is believed to belong to Tomi Ungerer



How we apply Thinking Strategically: Case studies we discuss



How we apply Thinking Strategically: Applications we discuss



Your choice of an experiment: Overview of all topics

1		Are boys or girls the better co-tenants?
2		Pricing a new phone
3		Capturing criminals
4		Compliance rather through carrot or stick?
5		A chess game
6		Chasing the bank robber
7		A race event or exhibition?
8		Crypto competition
9		Fun fair with friends
10		An online store

Presentation 1: Are boys or girls the better co-tenants?

Topic: You just graduated and want to move to New York for your first job. Unfortunately, you cannot afford a single apartment so that you must share it with another person, either a girl or a boy. If either of you does not take care of the rooms, you will both be charged.

Will you trust a male or female co-tenant more to be cooperative and play fair?



- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

Presentation 2: Pricing a new phone

Topic: You are a pricing manager at AlphaPhones and looking for a competitive price for your new smartphone. Your competitor, BetaGadgets, also launches an identical phone on the same day. You wish to meet with your competitor to set the identical price.

Would you prefer to meet individually with BetaGadgets' counterpart, or a team meeting increase the chances of cooperation?

- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group



Presentation 3: Capturing criminals



Topic: A small town facing increasing crime and hired you to counter it. You have the authority to capture and punish the culprits. After a week, you grabbed and severely fined a few criminals. But the crime rate has even increased.

What could be the possible reason for the increase in crime? Do you think a higher level of punishment failed to deter rule-breaking behaviors?

- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

Presentation 4: Compliance rather through carrot or stick?

Topic: Your kids are supposed to do their homework. As you have to do work yourself, you cannot observe them all the time but only once in a while; Still, you want them to work diligently on their exercises.

What will be your optimal strategy, will you rather ground them if they shirk or reward them with sweets if you see them work diligently?



- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

Presentation 5: A chess game

Topic: You were playing chess against Emma, who is unpredictable as she plays random most of the time. While trying to understand Emma's moves, you could not guess what she would do next. Suddenly, a study about figuring out how opponents play tricky moves in chess comes to your mind.



Can you win against Emma by decoding and capitalizing on random moves while reaching the final game?

- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

Presentation 6: Chasing the bank robber

Topic: As a policeman you are chasing a bank robber who has hidden in an abandoned residential building. He is either hidden in the basement or on the second floor. However, you have only time to check one of the options. If you choose the wrong one, the suspect will escape.

Where will you look for the criminal?



- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

Presentation 7: A race event or exhibition?

Topic: You and your partner are planning a weekend but can choose between two events to attend: a Nürburgring race event or an art gallery exhibition. You prefer to go to a race event. But your partner likes an exhibition.

Is a discussion better to convince your partner, or would just one sweet message increase the probability of selecting your chosen event?

- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group



Presentation 8: Crypto competition



Topic: In the cryptocurrency world, you and your sibling were trying to do better than each other. You did something unusual and decided to get rid of a bit of it on purpose. Meanwhile, your sibling played it safe and didn't do anything like that.

Would this strange move of burning money help you to win against your sibling in the cryptocurrency world, or was it a mistake that might cause problems?

- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

Presentation 9: Fun fair with friends



Topic: A group of friends planned to meet at a big fair but could not contact each other due to low cellphone connectivity. They have to decide where to meet without talking. They remembered a fun ride they all liked from last year's visit. When it was time to meet, everyone went to the ride, even though they didn't talk about it and were happy they found each other.

How did they all know to go on the ride without talking about it?

- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

Presentation 10: An online store



Topic: In an online store, sellers try to sell their handmade things and show positive things about their stuff under the product feature section. But some sellers claim their products are better than they really are. When buyers read what sellers claim, they cannot differentiate who is telling the truth.

Can buyers believe what sellers say when they want to sell their things?

- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find real-life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

Your path to conduct an experiment: An example

Let's start with an experiment!



The curious reproduction of jelly babies...

- You are living near a jelly baby park with free entrance and like jelly babies for lunch
- Life is for two periods: In Period 1, 8 jelly babies are in the park

In Period 2, due to asexual reproduction, the population doubles

Period 1: 8 jelly babies



Period 2: 16 jelly Babies



Your path to conduct an experiment: An example

What to do after the experiment?



Discussion with participants

- How did you experience the interaction?
What did you observe?
- What influence do you think did the communication before decision making?
- What effect does the observability of the interaction has on decision making?
- Do you think communication is coordination-enhancing?
- Are there other mechanism to solve the dilemma?
-

Period 1: 8 jelly babies

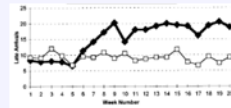


Period 2: 16 jelly Babies



- **Treatment 1:**
Individual decision making (IDM)
- **Treatment 2:**
Communication, then IDM
- **Treatment 3:**
Public communication, then IDM

Analysis of your experiment

#	QUESTION TO ASK YOURSELF	WHAT TO DO	EXAMPLE (SIMPLIFIED)
1	What did you do in the experiment?	Summarize your instructions	<i>Take jelly babies & communicate</i>
2	How did your fellow students behave?	Process the observations (visually & numerically)	
3	How did the different treatment conditions affect behavior?	Evaluate and compare your results	<i>Communication allows more jelly babies to reach period 2</i>
4	What did the experiment show?	Interpret your results	<i>Effect of communication and public action on a common resource game</i>
5	On which theoretical grounds is this experiment based?	Explain your results	<i>Altruism, reciprocity & inequity aversion</i>
6	How can the results be translated into a real life context?	Derive practical implications	<i>Communication and public monitoring against overfishing</i>

Your path to conduct an experiment: An example

How was this experiment constructed?



The underlying presentation: The cow and the land



Topic: Imagine all of you are cattle herders and share a common parcel of land, on which all of you can let your cows graze. You can let more cows graze on the land than the allotted number. As a consequence overgrazing results. The positive effect outweighs the effect of overgrazing you have to burry as an individual.

What would you rationally do? What would others rationally do?

What changes if all herders would communicate before the grazing period?

What happens if all grazing would be observable for all herders?

- Task:**
- Conduct a classroom experiment based on the paper
 - Present the paper and relate its results to the classroom experiment
 - Find linked real life examples and discuss them with your fellow students

Literature: Experimental paper will be distributed to the group

The underlying experimental paper: Velez et al. (2009)



Maria Alejandra Velez, John K. Stranlund & James J. Murphy (2009): What motivates common pool resource users? Experimental evidence from the field. Journal of Economic Behavior & Organization 70(2009), 485–497.

Abstract:

This paper develops and tests several models of pure Nash strategies of individual who extract from a common pool resource when they are motivated [...]. Using data from experiments conducted in three regions of Colombia that depend critically on a local fishery[...].

The original experiment by Velez et al. (2009)

- The experiment was conducted in three regions of Colombia in communities in which the primary activity is fishing
- Subjects were placed into groups of five and participated in a ten-period common pool resource game
- Subjects had to decide how much to extract from a common resource pool that refreshed each round and asked about their expectation of the other's extraction



- Communication between the subjects was forbidden in all rounds and all individual decision were kept private
- At the end of a round the aggregate level of extraction for that round was announced and individual payoffs calculated



The mean individual extraction level was below the predicted one

The expected level of extraction by others were estimated too low

How this field experiment was transformed into our classroom experiment

	Velez et al. (2009)	Classroom experiment
1. Subject pool:	<ul style="list-style-type: none"> 420 individuals from three regions in Colombia 	<ul style="list-style-type: none"> Students from this course
2. Setting:	<ul style="list-style-type: none"> Controlled laboratory experiment 	<ul style="list-style-type: none"> Classroom
3. Game:	<ul style="list-style-type: none"> Decision how much of the resource to extract The task is repeated for 20 rounds 	<ul style="list-style-type: none"> Decision how many jelly babies to take in period 1 One-shot game
4. Treatment:	<ul style="list-style-type: none"> Information of group extraction is revealed after each round, but individual information stays private 	<ul style="list-style-type: none"> T1: Pure decision T2: Communication and decision T3: Communication and public decision
5. Payoff:	<ul style="list-style-type: none"> Pesos cash payment 	<ul style="list-style-type: none"> Jelly babies

Your path to cope with your topic: Best practice



Read and understand your group's experimental research paper.



Analyze the underlying theoretical concepts and **relate** them to our course.



Develop a creative idea how to conduct an interactive (not purely writing/ paper based) experiment for a classroom that you would like to participate in, next **draft** the necessary instructions.



Discuss your ideas and questions with us (book a date via the provided doodle link).



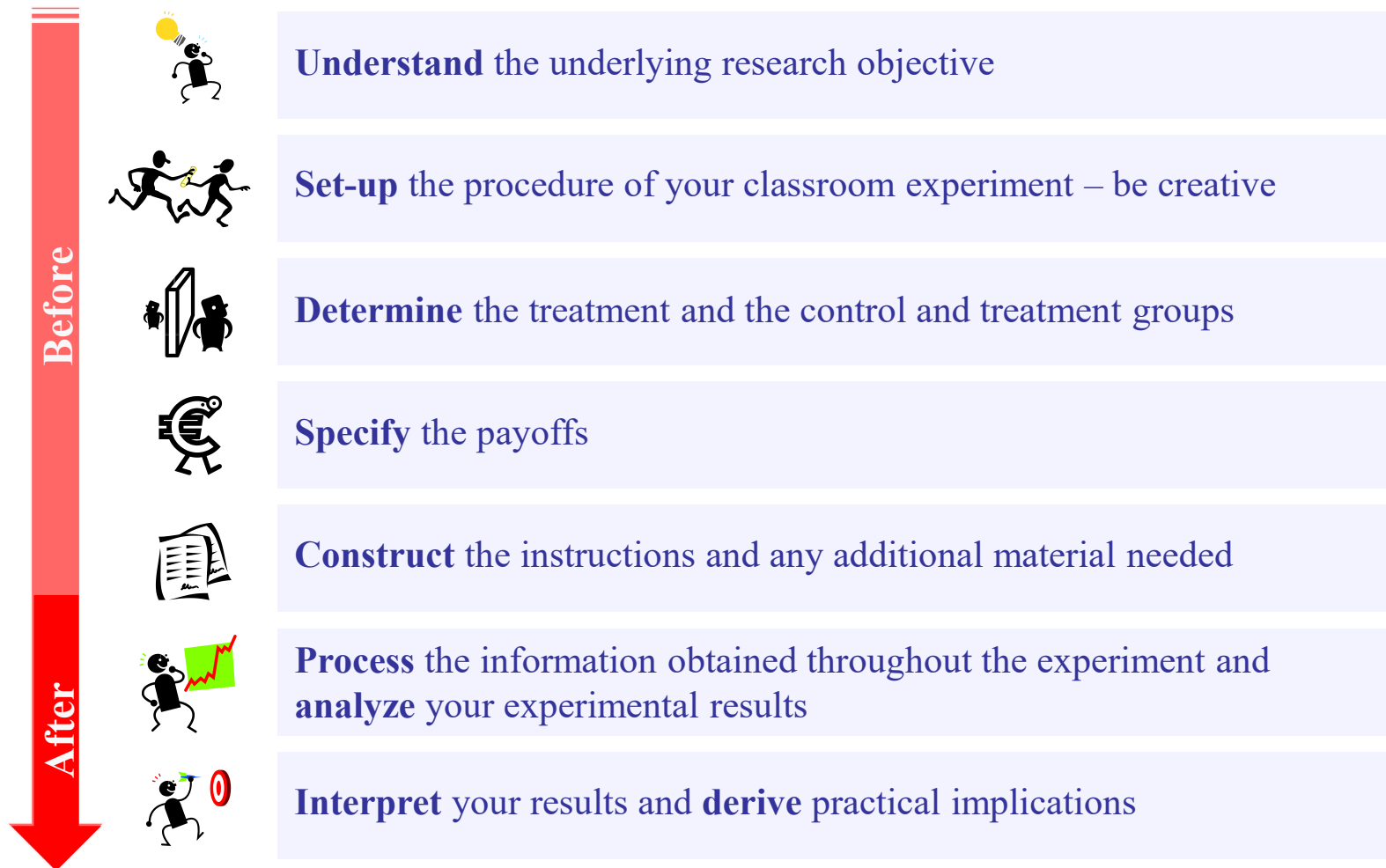
Prepare the experiment and a presentation.



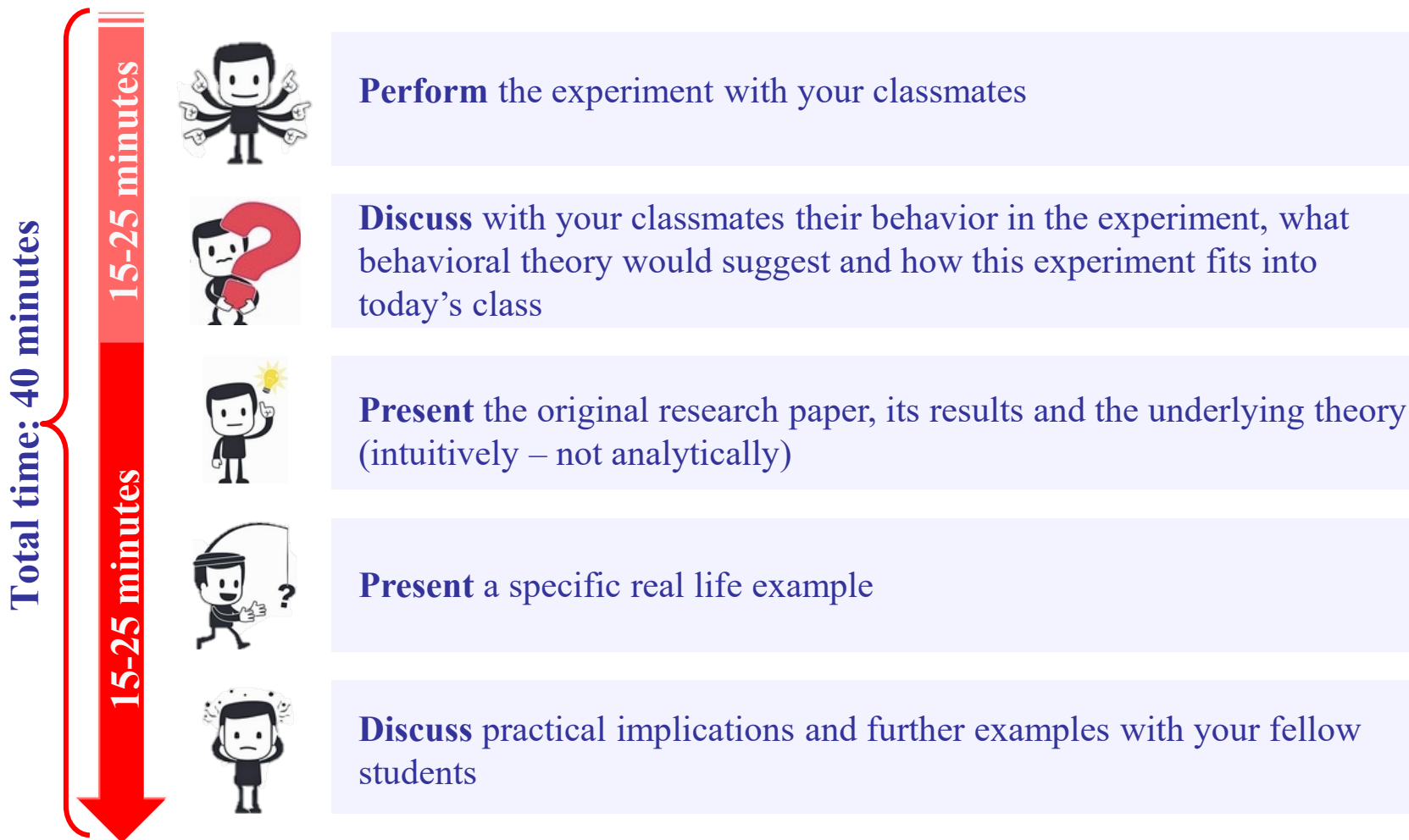
Conduct the classroom experiments and interactively **discuss** the theory and practical implications with students.



Your path to cope with your experiment: Best practice



Your path to cope with your presentation: Best practice



Your path to success: Experiment, presentation & individual assignments

Presentation

35%

- Submit your preferences until December 31, 2024 (end of the day) to pjjust@whu.edu
- Present the paper and theoretical framework to the class and lead a discussion about your observations and potential applications to real life with fellow students
- Submit your presentation slides until 23:59 (11:59pm) the night before the lecture in which you present to pjjust@whu.edu.

Experiment

30%

- Conduct a classroom experiment based on the one in your paper with your fellow students
- Explain the expected effects observed in the experiment and link them to the results of the paper

Individual assignments

35%

- After each Session 1-5 each student receives individual problem sets
- Each student solves these assignments individually and submits the hand-written solutions at the beginning of the next session. Only your 4 best (out of 5) assignments will be counted towards your grade
- No points are communicated to allow an advantageous grading process for students

Participation

Tiebreaker

- Your participation is used if you are in between two grades, further a good attendance and contribution to discussion facilitates understanding

How you benefit from this course: Assurance of Learning

Learning activity

Learning outcome



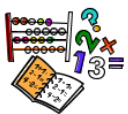
Attendance

Learning the basic principles of game theory will help you improve your own strategic thinking and your understanding why and how people make decisions



Group work

Learning to create value through team work will be useful for next group works, cases and internships



Assignments

Learning to apply game theoretical basics will serve as foundation for advanced courses



Paper analysis

Learning to analyze and apply a theoretical paper will help you to relate theory to praxis



Experiment

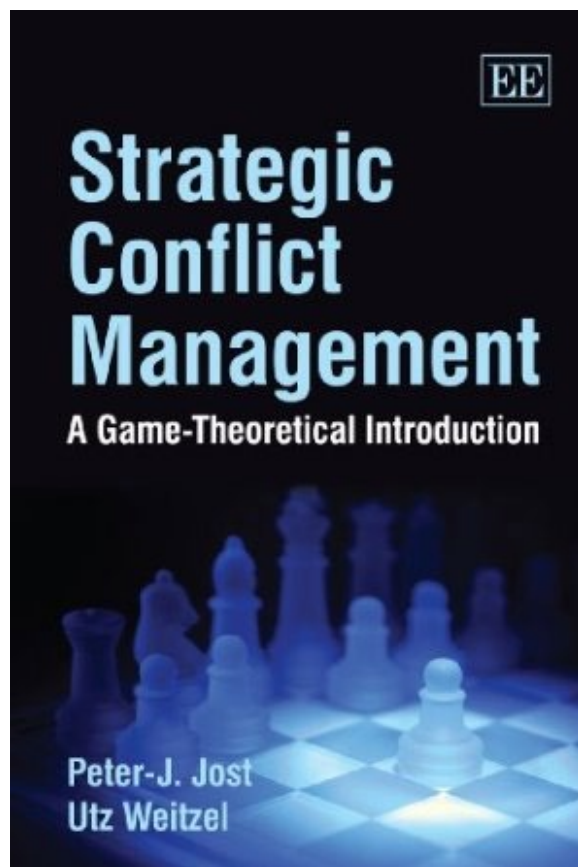
Learning a scientific method will be helpful for your bachelor and master thesis



Presentation

Learning to speak in front of others will be useful for your university and business career

How you learn more about Thinking Strategically: Literature



Lecture 1:
Theory of Games
& Moves

Chapter
2.2.3, 3.2.1, 3.3

Lecture 2:
Prisoner's
Dilemma Games

Chapter
2.1.3, 2.2.1, 5.1.1

Lecture 3:
Dis-coordination
Games

Chapter
2.2.4

Lecture 4:
Zero-Sum
Games

Chapter
2.1.2

Lecture 5:
Battle of
Sexes Games

Chapter
2.1.5, 2.2.5

Lecture 6:
Anti - &
Coordination
Games

Chapter
2.1.1, 2.1.6, 2.1.7

How you learn more about Thinking Strategically: Further readings

Textbooks on Game Theory

- **Dixit, A. & S. Skeath, 1999. Games of Strategy. Norton**
- **Gibbons, R., 1992, A Primer in Game Theory. Financial Times/Prentice Hall**
- **Harrington, J., 2008. Games, Strategies and Decision Making. Worth Publishers**

Fun & Games

- **Dixit, A. & B. Nalebuff, 1993. Thinking Strategically:. Norton**
- **Schelling, T. C., 1960. The Strategy of Conflict. Harvard University Press**
- **Schelling, T. C., 1978. Micromotives and Macrobehavior. Norton**

Applications

- **Brams, S. J., 2003. Biblical Games. MIT Press.**
- **Brams, S. J., 2011. Game Theory and the Humanities. MIT Press.**
- **Colman, A. J., 1995. Game Theory & its Applications. ButterworthHeinemann.**
- **Gates, S. & B. D. Humes, 1997. Games, Information, and Politics. University of Michigan Press.**
- **Ordeshook, P. C., 1986. Game Theory and Political Theory. Cambridge University Press.**