Game Theory for Social Scientists
Briefing Session

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Outline

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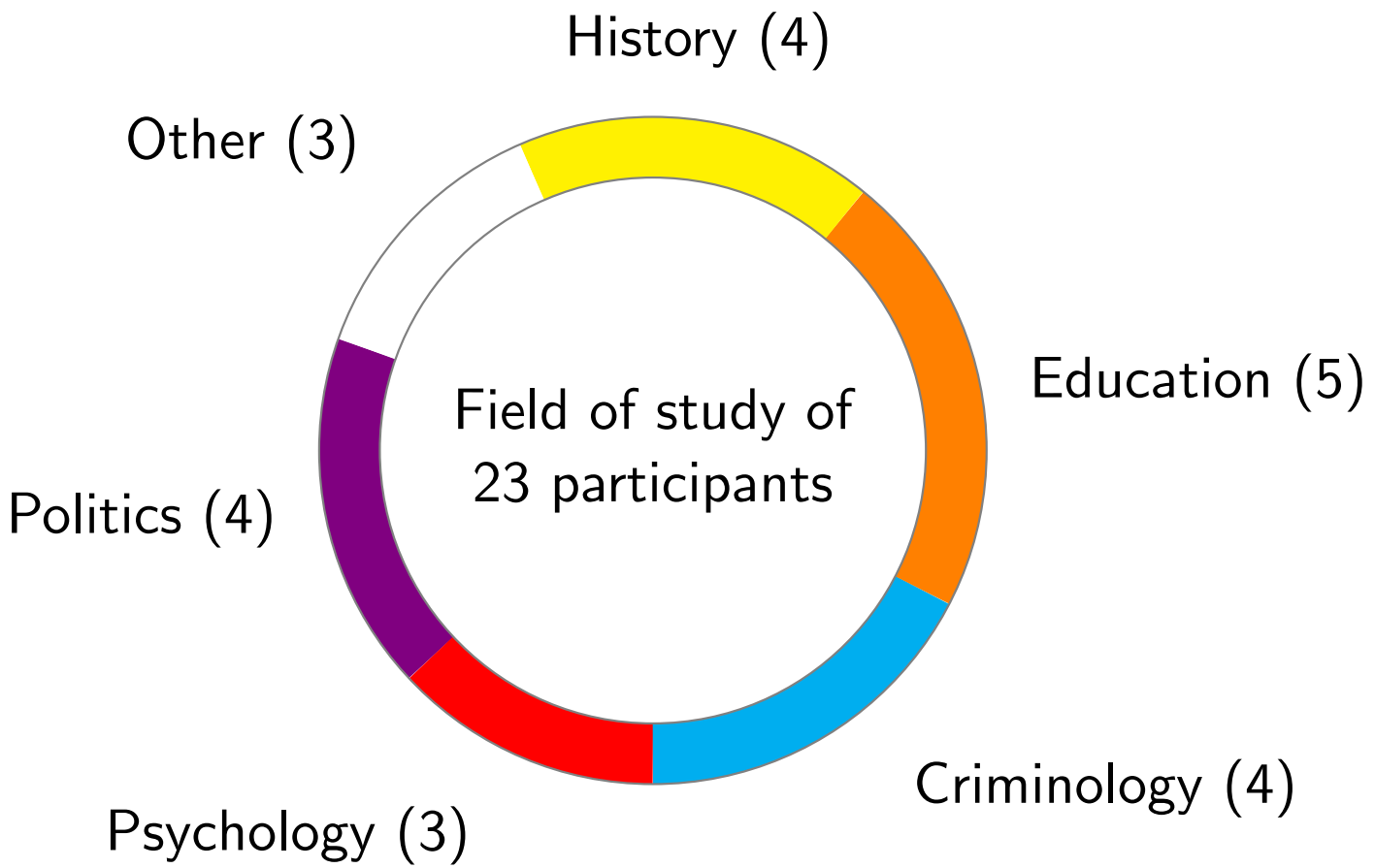
What are your expectations from the course?

Class profile



Module housekeeping

Prerequisites

- working knowledge of mathematics (elementary calculus)
- predominantly 'logical' reasoning
- little 'social' reasoning

Course structure

- Definitions and concepts (Kong)
- Simulations and workshops (Thilo)

Course material

- www.klein.co.uk/GameTheory

Outline

What is Game Theory?

Definition

- "Game theory concerns the behaviour of decision makers whose decisions affect each other"
  – *New Palgrave Dictionary of Economics, 2008.*
- Umbrella theory for the rational side of social science
- Methodologies apply to all interactive situations, especially in economics, political sciences, social psychology, etc.

Non-cooperative game theory

- Question: which actions do players choose?
- What is modeled: players, actions, payoffs
- What is not modeled: evolution of the game

Example: Guessing game

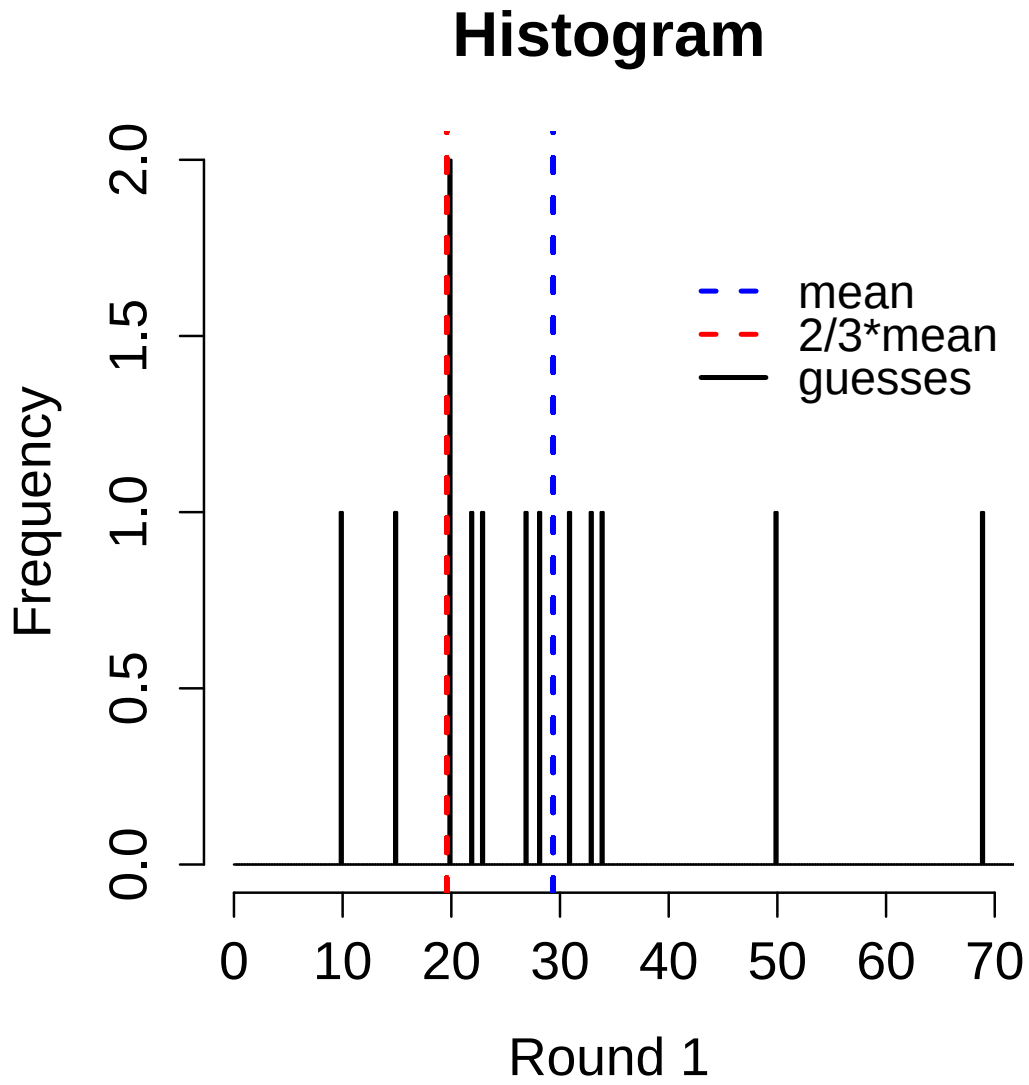
Guessing game

- Several people try to guess what 2/3 of the average of their guesses will be
- numbers are restricted to the real numbers in [0,100]
- the winner is the one closest to 2/3 the average.

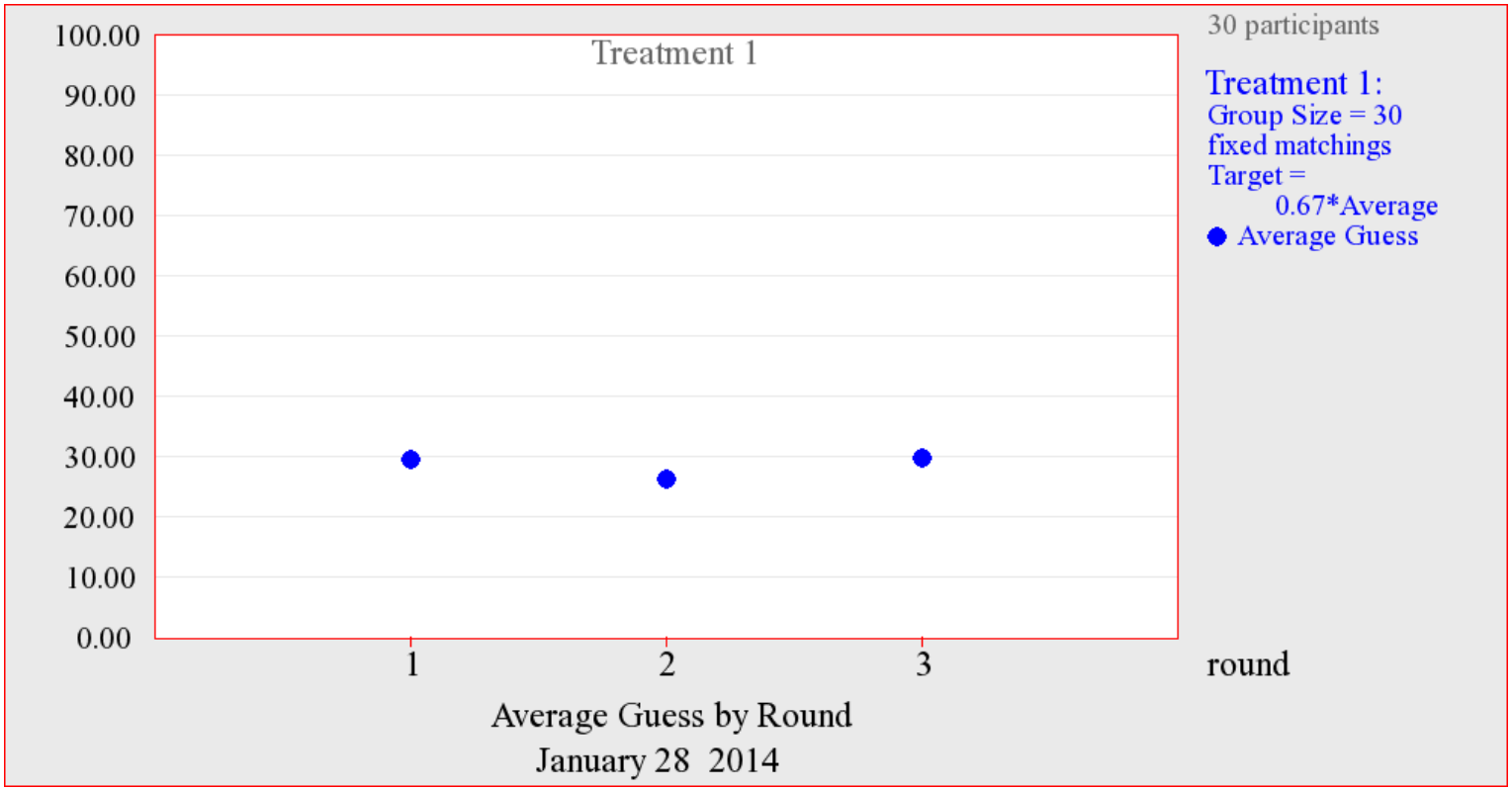
Instructions

- Go to http://veconlab.econ.virginia.edu/gg/
- 'Login as Participant'
- select 'Initial Login for All Programs'
- enter session name: tbkc1
- enter your name and password 1234
- follow instructions on the screen.

Guessing game: Round 1



Guessing game: Rounds 1 to 3



Guessing game: Analysis

Strategic reasoning

- What will other players do?
- What should I do in response?
- Each player *best responds* to the others: Nash equilibrium

Solving the guessing game

- Suppose a player believes the average play will be X
- Optimal strategy is to say closest integer to $\frac{2}{3}X$
- $X \leq 100$, so optimal strategy of any player has to be ≤ 67
- If $X \leq 67$, optimal strategy of any player has to be $\leq \frac{2}{3}67$
- Iterating, the unique Nash equilibrium is for every player to announce 0!

Guessing game: Analysis cont'd

- Look at a hypothetical world where all players are *rational*
- and where this is *common knowledge*.
- Under this "*common knowledge of rationality*" hypothesis, game theory makes two kinds of statements:

positive statement

All players *will* play a certain number (Nash equilibrium).

normative statement

All players *should* play this number.

Guessing Game: Application

Keynesian beauty contest: Pick the most popular kitten!

"It is not a case of choosing those [faces] that, to the best of one's judgment, are really the prettiest, nor even those that average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practice the fourth, fifth and higher degrees."
– *John Maynard Keynes, General Theory of Employment Interest and Money, 1936.*

Outline

Group projects

In a nutshell

- Groups of 2-3
- Focus on one of the generic games covered in course
- 3 milestones
  1. Short research proposal (1-2 pages)
  2. Group presentation (20 min)
  3. Optional: conduct experiment and document results in a short essay (6 pages)
- For details see the course website.

Course outline

Agenda

- Solution concepts in static games
- Dynamic extensive form games
- Repeated games
- Games of incomplete information

Group project topics

- Bargaining games
- Canonical games
- Dynamic and repeated games

Next steps

Timeline

- course registration closes Fri 30 Jan
- cancellations should be made before Fri 30 Jan
- by **Tue 3rd Feb**: decide on group members and choose project topic
- by **Tue 3rd March**: submit your research proposal

Your say!

Any Questions or Suggestions?

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