Behavioral Economics

Social Preferences

Michal Bauer

Warm up: Imagine you are in an experimental economics laboratory

- Choices are anonymous, incentivized (people get paid), you don't know anyone in the room

Warm up: Ultimatum game (UG)

- Set up
  - there are two players: a proposer and a receiver
  - The proposer decides how to split a pie (amount of money) of a fixed size between himself and the receiver.
  - The receiver can either accept the proposed split, in which case the split is implemented, or can reject it, in which case nobody gets anything
  - Anonymous interaction. One-time interaction.

- Imagine
  - You are a receiver
  - You don't know and will not know who is the proposer
  - Proposer gets CZK 500
  - Suggests the following split
    - CZK 500 for Proposer, CZK 0 for Receiver. Would you accept such offer? Y N
    - CZK 499 for Proposer, CZK 1 for Receiver . Would you accept such offer? Y N
    - CZK 480 for Proposer, CZK 20 for Receiver . Would you accept such offer? Y N
    - CZK 400 for Proposer, CZK 100 for Receiver . Would you accept such offer? Y N
    - CZK 350 for Proposer, CZK 150 for Receiver . Would you accept such offer? Y N
    - CZK 300 for Proposer, CZK 200 for Receiver . Would you accept such offer? Y N
    - CZK 250 for Proposer, CZK 250 for Receiver . Would you accept such offer? Y N

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Imagine you are receiver. What is the minimum amount that you would accept in this UG?

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Warm up: Ultimatum game (UG)

- **Predictions if agents are purely selfish agents**
  - Proposer?
  - Receiver?

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What is the predicted allocation of Proposer in UG?

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Proposer has endowment CZK 500. He decides how to split the amount. What is the minimum amount that Receiver is predicted to accept? Please type in number between 0-500.

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Warm up: Ultimatum game

- **Predictions** if agents are purely selfish agents
  - The proposer will offer the receiver next to nothing
  - The receiver will accept it

- Typical **results**: Proposer propose positive splits and low proposed splits are often rejected
  - Modal offer is 40-50% of the pie, very few offers are below 20%
  - Offers below 20% are rejected very often (more than 50%)
  - These results have been replicated many times, and differ substantially from the predictions based on sub-game perfect equilibrium with self-regarding preferences

Warm up: Ultimatum game

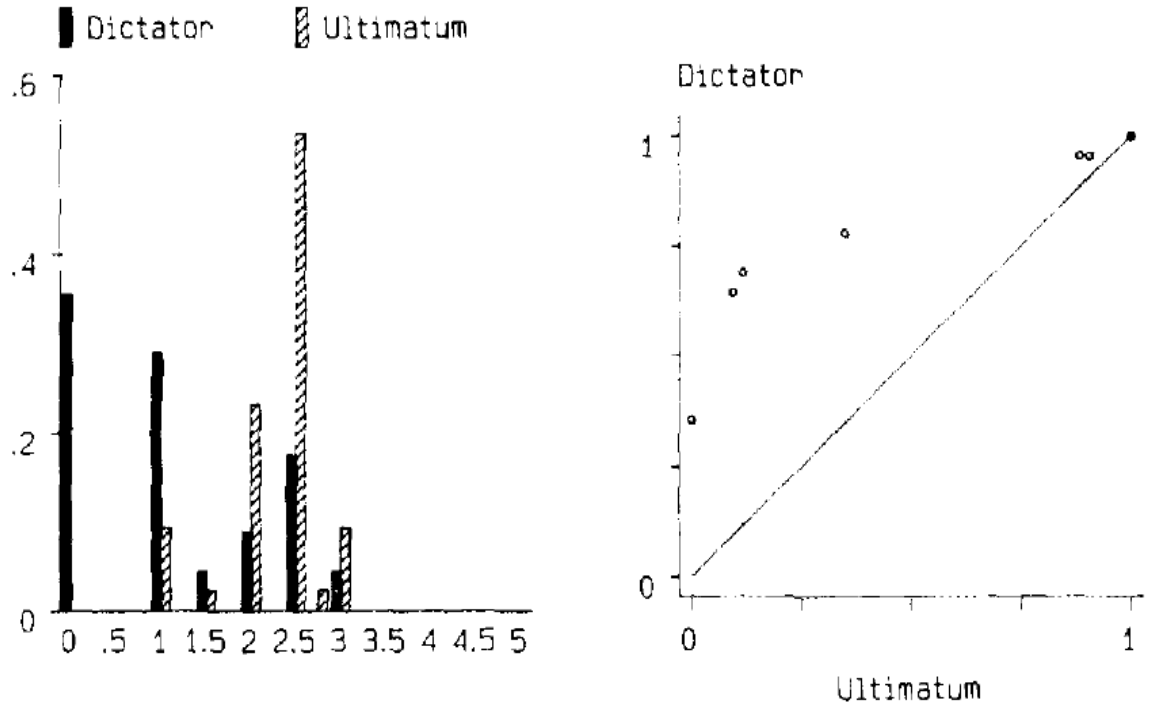

FIG. 3. Dictator with pay (pooled) vs ultimatum with pay (pooled).

Dictator game (DG)

- Basic **set up**
  - In this “game", there are two players: proposer and receiver.
  - The proposer decides how to split a pie (amount of money) of a fixed size between himself and the receiver.
  - The decision is then implemented.
  - The role of the receiver is completely passive.
- Typical lab **implementation**
  - the pie of $10 is provided by the experimenter (as mana from heaven).
  - Subjects are randomly split into proposers and receivers.
  - There is anonymity about the decisions of individual proposers or pairing of the proposers and receivers.
- How would you decide?
- What is the predicted outcome if everyone is purely selfish?

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Please fill in the survey

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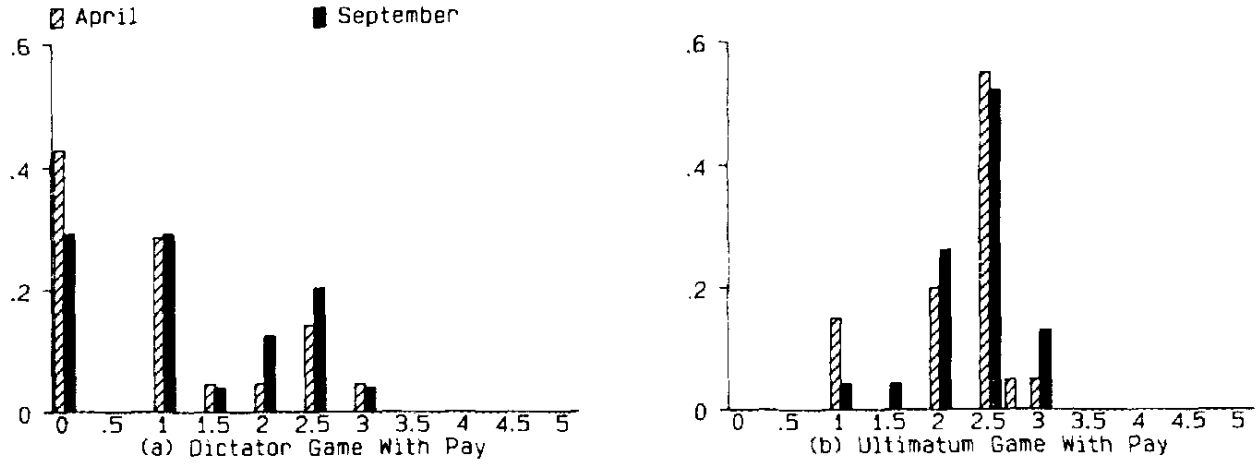
Dictator game

- Typical **results**
  - usually more than 60% of subjects pass a positive amount of money, with the mean transfer being roughly 20% of the endowment.
  - such results has been replicated many times ever since.
  - thus, it is apparent that many subjects do not behave completely selfishly, contrary to the conventional theory based on self-regarding preferences.



- The exact amount of giving is sensitive to procedural details though
  - Example: when the endowment is earned rather than received from the experimenter, the size of transfer diminishes

Plan for today

- Are people purely selfish?
- Models of social preferences
  - Altruism, inequality aversion, efficiency-seeking, reciprocity
- Social preferences can increase social welfare
  - Trust game, Prisoner's dilemma game

Back to textbook economics…..Assumptions about individual preferences

- Behavioral economics – takes seriously a broader set of motivations than neoclassical economics

- Two **traditional assumptions** about preferences
  - **Selfish**: their utility is a function only own payoff. In other words, unless there is scope for reputation-building, people will not trust anyone or will have no concern for fairness.
  - **Exogenous**: preferences are hard-wired traits that do not change much during the lifetime and do not respond to circumstances

- Why do we care?
  - Social preferences seem to be important for economic outcomes because they foster cooperation. It is evident that social preferences and trust are pervasive and conducive to successful economic transactions; moreover, their lack may seriously inhibit an economy's potential to prosper (linked to the notion of social capital).

Introducing social preferences
(Charness and Rabin 2002, QJE)

- Two-person example

$$U_1(x_1, x_2) = \rho x_2 + (1-\rho)x_1 \quad \text{when } x_1 \geq x_2$$
$$U_1(x_1, x_2) = \sigma x_2 + (1-\sigma)x_1 \quad \text{when } x_1 < x_2$$

- **Selfish** preferences
  - Intuition: people care only about own payoff
  - $\rho?, \sigma?$
  - Indifference curves?

x_2

Introducing social preferences
(Charness and Rabin 2002, QJE)

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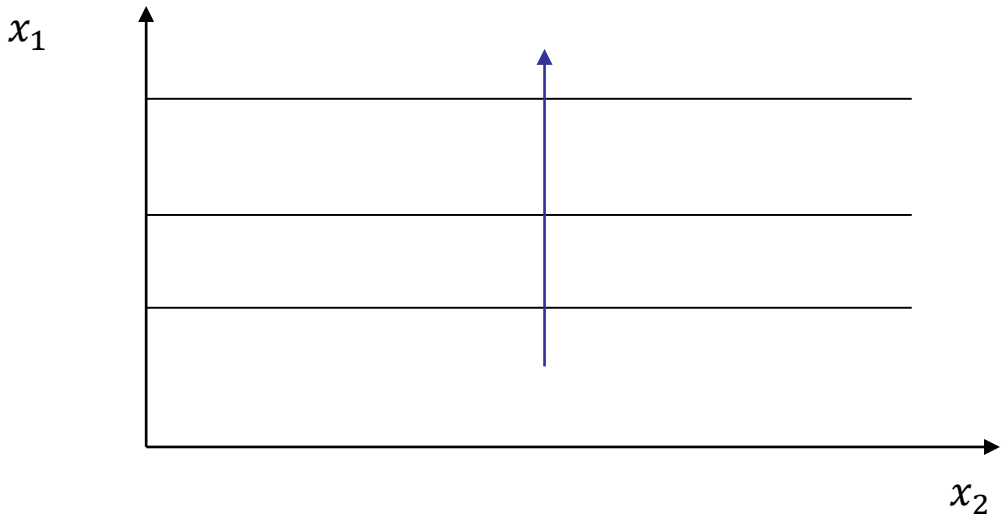
- **Selfish** preferences
  - $\rho = \sigma = 0$, and thus $\mathrm{U}(x_1) = x_1$



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- Pure **altruism**
  - Intuition: people weight positively payoff of another person
  - $\rho ?\, , \sigma ?$
  - Indifference curves

Altruism

- Two-person example

$$U_1(x_1, x_2) = \rho x_2 + (1-\rho)x_1 \quad \text{when } x_1 \geq x_2$$
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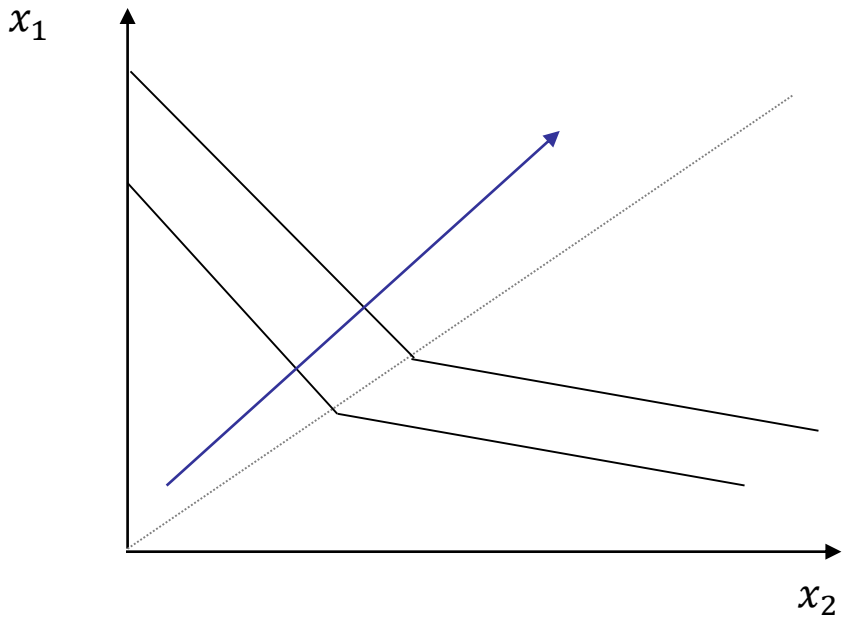
- Pure **altruism**
  - $\rho > 0 \ \ and \ \sigma > 0$; people weight positively payoff of another person
  - Sometimes additional assumption is made: people care more about the other person if she gets less than their own payoff: $0 < \sigma < \rho$



Spitefulness

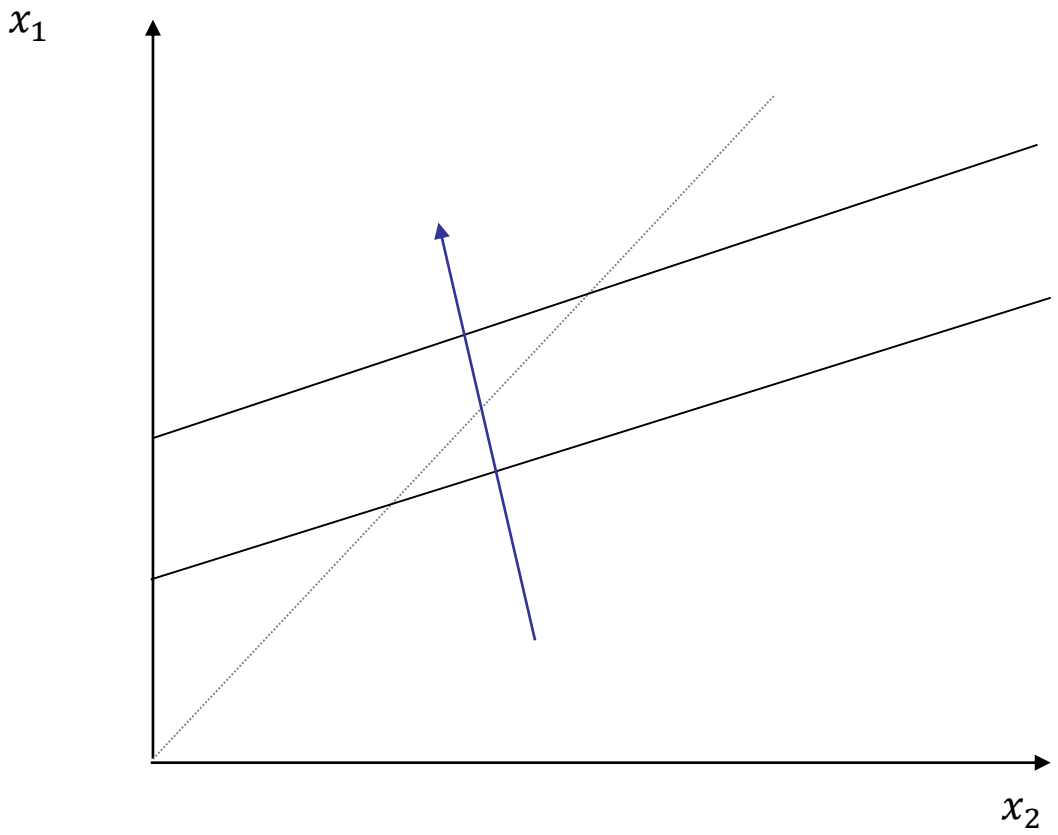
- Two-person example

$$U_1(x_1, x_2) = \rho x_2 + (1-\rho)x_1 \quad \text{when } x_1 \geq x_2$$
$$U_1(x_1, x_2) = \sigma x_2 + (1-\sigma)x_1 \quad \text{when } x_1 < x_2$$

- **Spitefulness**
  - Intuition: People weight negatively payoff of their partners
  - $\rho ?\, , \sigma ?$
  - Indifference curves?

Spitefulness

- **Spitefulness**
  - Intuition: People weight negatively payoff of their partners
  - $\rho < 0, \sigma < 0$



Inequality aversion

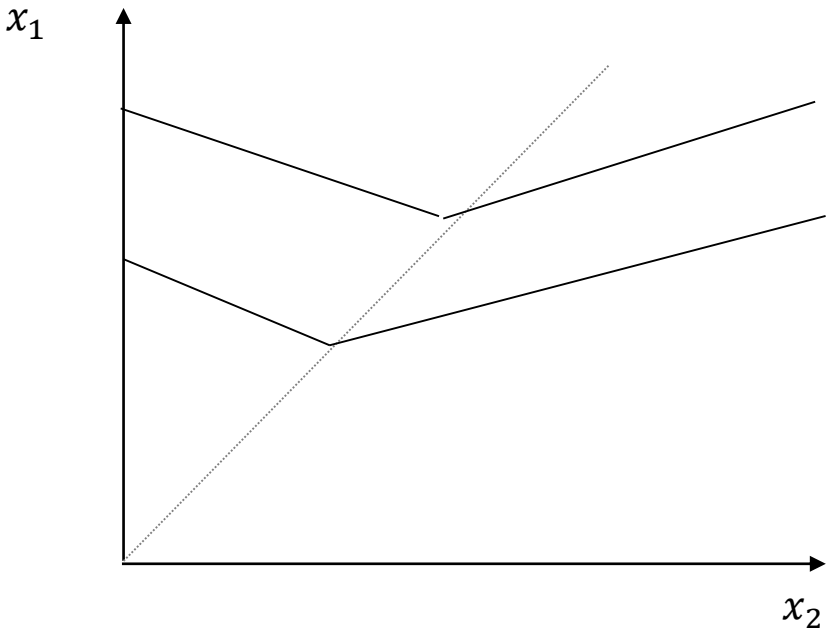
- Two-person example

$$U_1(x_1, x_2) = \rho x_2 + (1-\rho)x_1 \quad \text{when } x_1 \geq x_2$$
$$U_1(x_1, x_2) = \sigma x_2 + (1-\sigma)x_1 \quad \text{when } x_1 < x_2$$

- **Inequality aversion** (Fehr and Schmidt 02)
  - Intuition: People want to minimize disparities between their monetary payoff and their partners
  - $\rho?, \sigma?$
  - Indifference curves?

Inequality aversion

- **Inequality aversion** (Fehr and Schmidt 02)
  - Intuition: People want to minimize disparities between their monetary payoff and their partners
  - When $x_1 > x_2$, people are **aheadness averse** (altruistic): $0 < \rho < 1$
  - When $x_1 < x_2$, people are **behindness averse** (envious/spiteful): $\sigma < 0$
  - Behindness aversion is stronger than aheadness aversion: $\sigma < -\rho < 0$



Reciprocity

- Not outcome-based preference (as altruism, spite or inequality aversion), but **process-based preference**

- **Reciprocity**
  - Intuition: Acting kindly towards those who act kindly and being hostile towards those who are unkind
  - Two new parameters
    - Reciprocity parameter: $q = -1$ if person 2 misbehaved and $q = 1$ if player 2 acted kindly
    - $\theta > 0$ is sensitivity to reciprocity

- Utility function in the two-person example

$$U_1(x_1, x_2) = (\rho + \theta q)x_2 + (1 - \rho - \theta q)x_1$$

Plan for today

- Are people purely selfish?
- Models of social preferences
  - Altruism, inequality aversion, spitefulness, reciprocity
- Social preferences can generate a higher social welfare
  - Trust game
  - Prisoners' dilemma game

Trust game (TG) and reciprocity

- Illustrates how social preferences can generate greater social welfare
- It aims to **captures the key elements of principal-agent problems** and it provides evidence of strong reciprocal preferences
- **Set up**:
  - There are two players: trustor (investor) and trustee (agent). One-shot interaction.
  - The trustor is endowed with a budget X and can send a part of the money $Y \leq X$ to the trustee.
  - The money gets multiplied on the way to the trustee by a factor of $\propto > 1$. This can be thought of as **returns to cooperation**.
  - The trustee may send any part $Z \leq \propto Y$ of it (including none and all) back to the trustor.
    - This can be thought of as the agent returning the investment with its returns, minus some commission fee, back to the investor, or, if returning nothing, simply stealing the investor's money.
  - The ultimate payoffs
    - to the trustor $X - Y + Z$
    - to the trustee is $\propto \mathrm{Y} - Z$
- The amount transferred by trustor is referred to as **trust**.
- The amount transferred back by the trustee is referred to as **trustworthiness**

Trust game (TG) and reciprocity

- This game was first experimentally implemented by Berg, Dickhaut and McCabe (1995) with $X = \$10$ and $\propto = 3$.

- What are the **predictions** of subgame-perfect equilibrium with self-regarding preferences?

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What is the predicted allocation of trustor? How much is s/he predicted to send to trustee out of $10?

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Trust game (TG) and reciprocity

- This game was first experimentally implemented by Berg, Dickhaut and McCabe (1995) with $X = \$10$ and $\propto = 3$.

- What are the **predictions** of subgame-perfect equilibrium with self-regarding preferences?
  - No transfers. Trustee should not transfer anything back. And knowing this, trustor is predicted not to transfer anything in the first place.

- **Findings** from TG
  - Most of the studies find 45% of the endowment transferred and around 33% transferred back (around zero return to trust), but not selfish behavior.

- **Interpretation** of transfers
  - Back transfers (**trustee behavior**) are typically attributed to reciprocal preferences
  - Transfers of the **trustor** can be motivated by
    - **beliefs** about trustworthiness
    - social preferences towards trustee (**altruism, efficiency-seeking**)

Trust game (TG) and reciprocity

Table 3
Descriptive statistics by country.

Country	Number of studies	Total sample size	Average fraction sent	Average proportion returned
Argentina	3	678	0.43	0.40
Australia	2	196	0.51	0.32
Austria	6	508	0.62	0.38
Bangladesh	4	863	0.46	0.46
Brazil	2	138	0.71	0.45
Bulgaria	2	62	0.57	0.39
Cameroon	2	320	0.70	0.47
Canada	5	432	0.60	0.31
China	5	1036	0.48	0.55
Colombia	2	722	0.37	0.23
Costa Rica	1	425	0.46	0.26
France	9	1008	0.43	0.33
Germany	15	1315	0.51	0.44
Honduras	1	758	0.49	0.42
Hungary	1	74	0.51	0.40
India	1	92	0.49	0.29
Israel	2	535	0.59	0.45
Italy	8	763	0.43	0.31
Japan	2	78	0.58	0.32
Kenya	4	646	0.38	0.32
Netherlands	6	751	0.46	0.33
New Zealand	2	123	0.44	0.22
Paraguay	1	188	0.47	0.43
Peru	2	1245	0.48	0.46
Russia	2	758	0.49	0.37
South Africa	4	775	0.44	0.24
South Korea	1	52	0.67	0.29
Sweden	4	941	0.74	0.37
Switzerland	1	986	0.66	0.53
Tanzania	2	310	0.54	0.40
Uganda	2	246	0.45	0.33
United Kingdom	5	274	0.54	0.28
United States	46	4552	0.51	0.34
Uruguay	1	579	0.45	0.29
Vietnam	2	194	0.33	n/a

Prisoner's dilemma game

- 2 players, anonymous, cannot communicate
- Each makes a choice whether to cooperate or defect simultaneously
- Questions
  - What do you think is the predicted outcome of this game, if both players are selfish and the game is **one-shot**?
  - What do you think the predicted outcome of this game, if both players are selfish and the game is **repeated** ten times among the same individuals?

		Player B	
		Cooperative	Defect
Player A	Cooperative	(16; 16)	(8; 20)
	Defect	(20; 8)	(12; 12)

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What is the predicted behavior in the Prisoner's dilemma game if both players are selfish?

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Cooperation and Prisoner's dilemma game

- **Creation of economic surplus often requires cooperation** of involved parties.
  - But such situations have an in-build **conflict** between taking a privately costly action that improves **social welfare** and a non-costly action that only suits **private interests** of the player.
  - **So far**, we have studied an example of **sequential game** illustrating the conflict b/w self-interest and social welfare: **trust game**

- **Prisoner's dilemma** game (PD)
  - workhorse for studying cooperation
  - **Simultaneous** move game, in which players act without knowing action of the other player.
  - Two players, who are, regardless of the strategy of the other player, are always strictly better of (in monetary terms) to take non-cooperative action (defect, confess, cheat, free-ride,..)

Prisoner's dilemma game - Example

- This game has, in fact, a Dominant Strategy Equilibrium: (Defect, Defect).
  - **Defect is a dominant strategy** for both players
- In fact, this is also the only Nash Equilibrium of the game.
  - This is the unique **prediction** of game theory (with self-regarding preferences) for this game.

		Player B	
		Cooperative	Defect
Player A	Cooperative	(16; 16)	(8; 20)
	Defect	(20; 8)	(12; 12)

Prisoner's dilemma game: Set up and predictions

- **General Case** for a symmetric 2x2 PD with c>a>b>d:

		Player B	
		Cooperative	Defect
Player A	Cooperative	(a; a)	(d; c)
	Defect	(c; d)	(b; b)

- In real life, **interactions** between the same people often **repeat**.
  - **Question**: Are **predictions** different if this game is repeated between a fixed pair of players, and thus there is an opportunity to punish previous non-cooperation?

Prisoner's dilemma game: Set up and predictions

- **General Case** for a symmetric 2x2 PD with c>a>b>d:

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- In real life, **interactions** between the same people often **repeat**.
  - **Question**: Are **predictions** different if this game is repeated between a fixed pair of players, and thus there is an opportunity to punish previous non-cooperation?
  - Answer: No, the **unique subgame-perfect equilibrium** of finitely repeated PD games is eternal **defection**. This can be easily seen by backward induction.

Prisoner's dilemma game with altruistic Player 1

Many subjects are at least somewhat cooperative even if the game is repeated only finitely many times, sometimes even only once (Dawes and Thaler 1988)

Explanation: Altruism (or efficiency seeking)

– Suppose that Player 1 enjoys a "warm glow" feel from cooperation captured in money-equivalent premium of δ, whereas Player 2 is selfish

		Player B	
		Cooperative	Defect
Player A	Cooperative	$(a+\delta, a)$	$(d+\delta, c)$
	Defect	(c, d)	(b, b)

– if $\delta < \min(c-a, b-d)$, P 1 is labeled as **egoist**. Will always choose to defect. The warm glow is too small to affect behavior.

– if $\delta > \max(c-a, b-d)$, the dominant strategy is to cooperate. Such Player 1 is labeled **dominant strategy altruist**.

– Player 1 with intermediate values $c-a < \delta < b-d$, or $b-d < \delta < c-a$ is called **best response altruist**.

– As long as there are players of the later two types, cooperation will be observed in both repeated and one-shot versions of PD.

Other explanation?

Lessons from today

- Are people purely selfish?
  - No, motivations of many are broader
- Models of social preferences
  - Altruism, inequality aversion, efficiency-seeking, reciprocity
- Social preferences can increase social welfare
  - Trust game, Prisoner's dilemma game