

1. Strong Reciprocity Is Common
2. Free-Riders Undermine Cooperation
3. Altruistic Punishment Sustains Cooperation
4. Effective Punishment Depends On Legitimacy
5. Symbolic Punishment Is Effective
6. People Punish Those Who Hurt Others
7. Behaviour Is Conditioned on Group Membership
8. People Enjoy Punishing Free Riders
9. Ecological Validity

Behavioural Economics

PSYC3310: Specialist Topics in Psychology

Seminar 8: Social Preferences

CSIRO-UWA | Behavioural
Economics
Laboratory

Today

Behavioural Economics

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Outline

Key Findings

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- Examine preferences (4) in the standard model—**component 4**)

(1)	(2)	(3)	(4)
$\max_{x_i^t \in X_i}$	$\sum_{t=0}^{\infty} \delta^t$	$\sum_{s_t \in S_t} p(s_t)$	$U(x_i^t s_t)$

- Social preferences
 - confront the model with data

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The Standard Model: Main Assumptions

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- Economic agents are motivated purely by self-interest
- Often referred to as a **pure self-interest** model—closely related to rationality assumption
- Not as sinister as is often portrayed:
 - people maximize utility functions that only take into account “self-regarding” preferences
 - utility functions that take into account “other-regarding” preferences are simply omitted
- Simple and attractive, but not realistic

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- Even selfish individuals “take into account” the effects of their behaviour on others
- This “taking into account” may not be deliberate—could be the result of emotions such as *guilt*, *anger*, *envy*, *pity*, *outrage*, or *disgust*
- A model based on people acting in their self-interest is consistent with people having other-regarding preferences
 - the standard model simply doesn't take the latter preferences into account

Anomalies Relating to “Pure Self-Interest” Aspect of Standard Model

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- Tipping waiters
- Giving to charity
- Completing tax returns honestly
- Voluntary unpaid work
- Working harder when there are no monetary incentives than when there are monetary incentives
- Monopolies not raising prices when there are shortages
- Contributing to the provision of public goods
- Punishing those riders even when there is a cost of doing so
- Investing in others and trusting them to repay

Key Findings From The Experimental Laboratory

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- We review several key findings from the experimental laboratory
- The vehicles for these discoveries are an assortment of economic games, including:
 - ultimatum game
 - public goods game
 - public goods with punishment game
 - dictator game with third-party punishment
 - trust game
- The findings represent “stylised facts” about human cooperation and social preferences

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- 1 Fairness, the Dictator Game, and the Ultimatum Game (Speaker 1)
- 2 Gift Exchange Game and Non-monetary Utility (Speaker 2))
- 3 Punishment and Cooperation (Speaker 3)

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- A **strong reciprocator** is an individual who is willing to:

“sacrifice resources for rewarding fair and punishing unfair behavior even if this is costly and provides neither present nor future material rewards for the reciprocator”

- Thus, strong reciprocators reciprocate both **positively** (respond to kindness with kindness) and **negatively** (meet hostility with hostility)
- Positive reciprocity promotes cooperation, and negative reciprocity stabilises it
- In laboratory experiments, strong reciprocity is common

Ultimatum Game

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- In the **ultimatum game** there are two players: proposer and receiver
- A proposer is given a sum of money, say \$10
- She must decide how much of that money to give to the receiver
- The receiver must decide to accept or reject the offer
- If he accepts, the receiver gets what he is given and the proposer keeps the rest
- If he rejects, both get zero

Ultimatum Game

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- The self-interest axiom provides a clear prediction of how the game will be played
- Because the game is one-shot and anonymous, the responder will accept any positive amount of money
- Knowing this, a self-regarding proposer will offer \$1, and this will be accepted
- This is not typically what happens though

Proposers Have Social Preferences (Forsythe et al., 1994; Slonim & Roth, 1998)

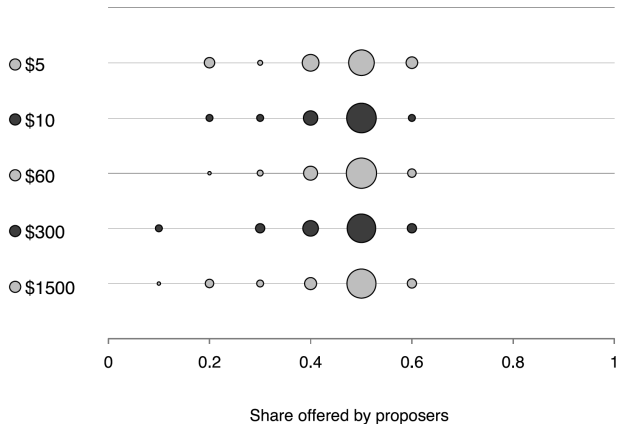
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Receivers Have Social Preferences Too (Larrick & Blount, 1997)

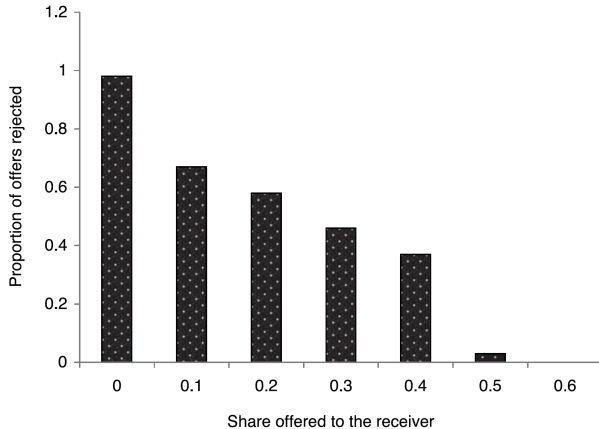
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- Why do acceptors reject positive offers?
- They are motivated by a desire to punish the proposer for being unfair, even though it means giving up some money to do so
- In support of this, in post game de-briefings responders who have rejected low offers often express anger at the proposer's greed and a desire to punish unfair behaviour
- This is evidence of strong reciprocity

Prisoners' Dilemma Game

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- The **prisoners' dilemma game** is perhaps the most famous of all experimental games
- In this game there are two players, call them Alice and Bob
- They interact only once and cannot make any binding agreements
- Each player can choose one of two strategies, without knowing the strategy chosen by the other:
 - 1 cooperate (C) or
 - 2 defect (D)

Prisoners' Dilemma Game: Payoff Matrix

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		Bob	
		C	D
Alice	C	10,10	0,15
	D	15,0	5,5

Prisoners' Dilemma Game

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- Despite the strong temptation to defect, many experiments have found that a considerable fraction of subjects (30%–40%) prefer to cooperate (Sally, 1995)
- This is clearly at variance with the strong prediction under the self-interest axiom of complete defection
- The fraction of cooperators increases if Alice (Bob) can be given assurances that Bob (Alice) will cooperate (Kiyonari et al. (2000):
 - standard simultaneous prisoners' dilemma (38%)
 - sequential "second player" prisoners' dilemma (62%)
 - sequential "first player" prisoners' dilemma (59%)
- This is further evidence of strong reciprocity

2. Free-Riders Undermine Cooperation

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- In a social dilemma that is repeated for a number of rounds, subjects tend to start with a positive and significant level of cooperation
- However, unless there are very few **free-riders** in the group cooperation subsequently decays to a very low level
 - a free-rider is someone who benefits from the contributions of other group members, while himself contributing less or nothing at all
- This decay of cooperation is observed in the experimental **public goods game**

Public Goods Game

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- A group of four players are each given \$20 as a reward for participating in each of ten rounds of the game
- On each round, the players must decide how much of this \$20 to contribute to a “public pool”
- At the end of each round, the contents of the pool is doubled and then divided equally among all the players, irrespective of their contribution
- The *social dilemma* lies in the conflict between the group and the individual’s interest
- The group does best when all players cooperate but deviations from full cooperation are individually profitable

Decay of Cooperation

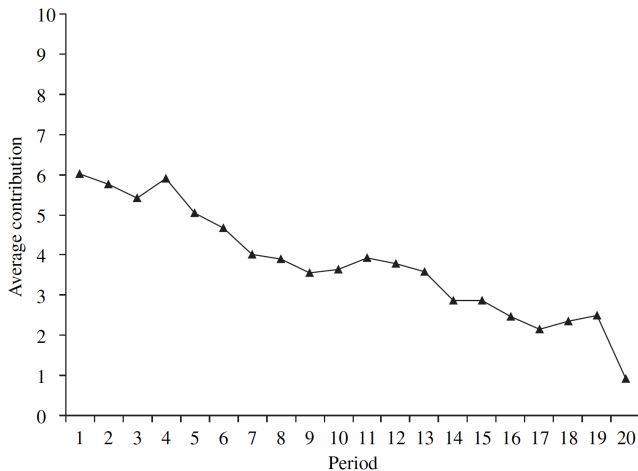
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- Supporters of the self-interest axiom would interpret the initial high contributions as confusion on the part of the subjects, who are not accustomed to anonymous interactions
- The decay in contributions is due to subjects learning how to maximise their payoffs
- If this explanation is correct, if the same subjects were permitted to play a second multi-round public goods game identical to the first, they should refuse to contribute on the very first round
- Cookson (2000) tested this prediction and found it to be wrong

Cookson (2000)

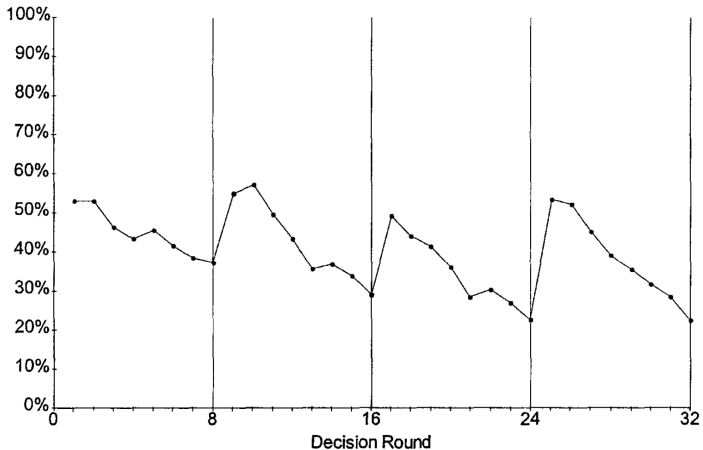
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The public goods game is played with several groups and after every series of rounds group membership is reshuffled and the game is restarted.

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- An alternative interpretation is that public-spirited contributors want to retaliate against free-riders and the only way available to them in the game is by not contributing themselves
- Subjects often report this reason for the unraveling of cooperation retrospectively
- Further evidence for this view comes from a study by Page et al. (2005)

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- All subjects initially played a multi-round public goods game
- In a *regrouping condition*, subjects were given a list of the average contributions of the other players and were permitted to rank their preference for playing with one or more of these subjects
- Subjects who ranked each other highly were assigned to the same group, and subjects who were not ranked highly by others were also assigned to the same group
- In a *baseline condition*, assignment to conditions was performed randomly by the experimenter
- Both conditions then completed another multi-round public goods game

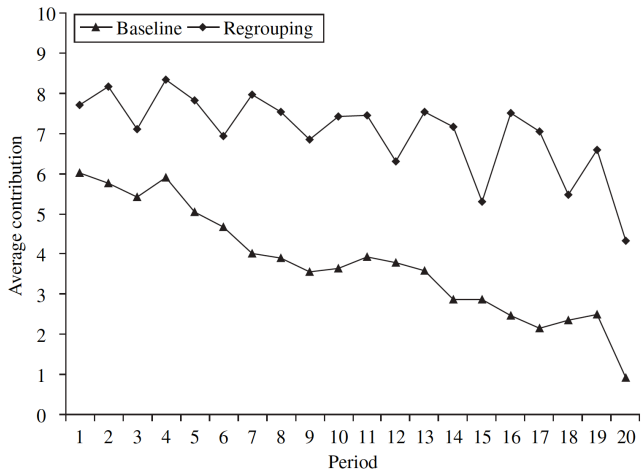
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- The decay of cooperation is due to relatively high contributors reacting to low contributors by lowering their own contribution
- When subjects in the same group are relatively uniform in their contributing behaviour, this decay mechanism is attenuated
- These experiments show that when those predisposed to cooperate can associate preferentially with like-minded people, cooperation is not difficult to sustain

3. Altruistic Punishment Sustains Cooperation

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- In the standard public goods game, the only way cooperators can retaliate against free-riders is by withholding their cooperation
- However, in the **public goods with punishment game**, subjects are given a direct way of retaliating against free riders
- In this game, strong reciprocators use punishment in a way that helps to sustain cooperation
- Because this punishment is costly to the punisher as well as the target, the punishment is considered “altruistic”

Fehr and Gächter (2002): Public Goods With Punishment Game

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- Two conditions:
 - *Without punishment*
 - similar to the public goods game previously described
 - *With punishment*
 - players can punish group members by assigning punishment points
 - 1 punishment point = \$1 to the player awarding the punishment vs. \$3 to the player being punished
- Since punishment is costly, a self-interested player should never punish
- In practice, punishment is both common and very effective

Fehr and Gächter (2002)

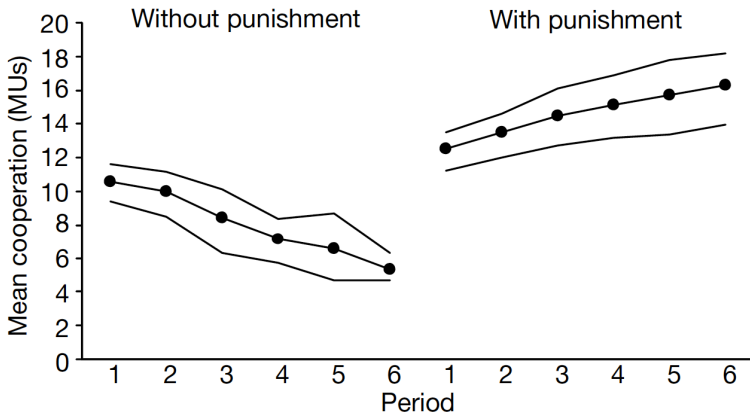
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Why Do Subjects Punish?

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- One account is that it subjects punish free-riders to alter their behaviour or to affect the distribution of payoffs
- Another account is that subjects view punishment of free-riders as “retribution”
- Evidence supports the latter account:
 - subjects punish free-riders even in non-repeated interactions (Falk et al. 2005) ...
 - ... and in repeated interactions where punishments are not revealed until the end of the experiment (Drew et al. 2010)
- Thus, subjects enjoy punishment, where ‘enjoyment’ includes anger and a desire for retribution

4. Effective Punishment Depends On Legitimacy

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- We have seen that altruistic punishment enhances cooperation among members of a group
- But it raises a new question
- Do groups that punish free-riders actually benefit, or do the costs of punishing outweigh the benefits to cooperation that result?

Altruistic And Antisocial Punishment

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- Herrmann et al. (2008) performed a public goods with punishment game—similar to the Fehr and Gächter experiment—using subject pools from 15 populations (e.g., Boston, Zurich, Riyadh, Muscat, Chengdu)
- As in earlier experiments, when the punishment option was available it was widely used, especially in the early periods, and as a result the unraveling of contributions did not occur
- However, surprisingly, averaging over the 10 periods, most of the subject pools had higher average payoffs when the punishment option was precluded
- Why is this so?

Herrmann et al. (2008)

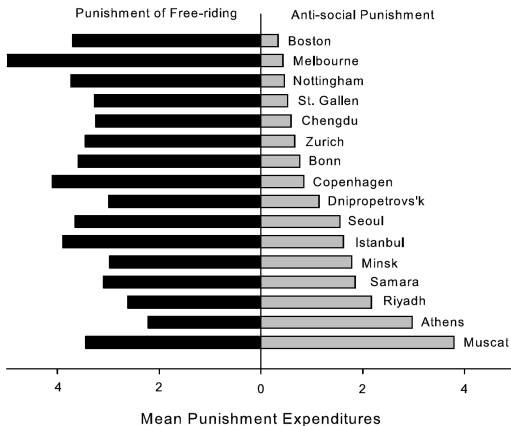
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In many societies, a significant amount of punishment was directed at high contributors (anti-social punishment), possibly as a retaliation against punishment received in earlier rounds by subjects who believed that it was the high contributors who were doing most of the punishment

Herrmann et al. (2008)

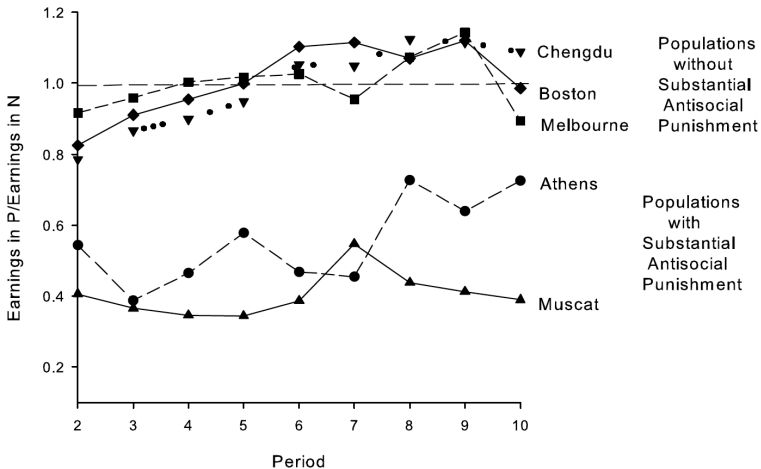
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Herrmann et al. (2008)

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9. Ecological Validity

- The interpretation of these results is that punishment depends on legitimacy
- Punishment of free-riders, was legitimate in Boston, Melbourne, and Chengdu, but it was not in Muscat and Athens
- In the latter countries, punishment is coordinated by ridicule or gossip—it does not inflict material costs—and is rarely carried out by a single individual
- The legitimacy of punishment is therefore to some degree culturally determined

Does Frequency Of Interaction Matter?

Behavioural Economics

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1. Strong Reciprocity Is Common
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- Gächter et al. (2008) tested whether the net returns to having a punishment option are high when the game is repeated a sufficient number of rounds
- They used the same game as Fehr and Gächter (2002), but allowed groups to interact for 50 rounds, rather than just 10
- They found that after the initial rounds, the net benefits to the group with the punishment option significantly exceeded those of the no-punishment group

Gächter et al. (2008)

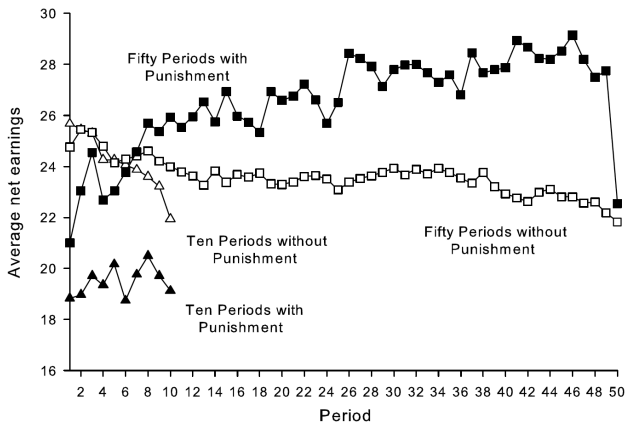
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In the 50 round condition, after the initial rounds, the “fear” of punishment is enough to sustain cooperation over subsequent rounds

Do Groups Benefit From a Punishment Option?

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- Having a punishment option improves group outcomes, provided interactions between group members are frequent
- But the punishment mechanism must be legitimate to avoid vendetta like retaliation
- What punishment is legitimate is to some degree culturally determined

5. Purely Symbolic Punishment Is Effective

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- Punishment is effective even when it takes the form of criticism by peers, rather than a reduction in material payoffs
- Masclet et al. (2003):
 - when subjects can assign “disapproval points” to group members, contributions to the public good increase
- Barr (2001):
 - contributions to the public good increase when subjects can publicly shame free riders
- Gächter and Fehr (1999):
 - making individual contributions publicly observable substantially raises contributions to the public good

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- These results, and those of Falk et al. (2005) and Drew et al. (2009) suggest:
 - ① the objective of punishment is not simply behaviour modification, but punishment per se
 - ② the target's positive response to punishment is an attempt to right a wrong in the eyes of fellow group members
- The self-interest axiom cannot explain the frequency nor effectiveness of punishment

6. People Punish Those Who Hurt Others

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- People don't just punish those that have hurt them
- They also punish those who hurt others
- This occurs when the action causing the hurt violates a “social norm”
- Punishment is thus not simply retaliation in response to personal damages—it appears to reflect more general ethical norms

Fehr and Fischbacher (2004): Third Party Punishment and Social Norms

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- **Dictator game with third-party punishment**
- Three players: dictator, recipient, and observer
- Game between dictator and recipient is a dictator game
- Dictator given an endowment of \$100 and can transfer any amount to recipient (the recipient has no say in the matter)
- The observer—the “third party”—has an endowment of \$50 and observes the dictator’s transfer
- After this, the observer can assign punishment points

Fehr and Fischbacher (2004): Third Party Punishment and Social Norms

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- Each punishment point assigned to the dictator costs the observer \$1
 - dictator incurs a penalty of \$3
- Since punishment is costly, a self regarding observer will never punish
- However, if there is a “sharing” or “fairness” norm, an observer may well punish the dictator if she gives too little

Fehr and Fischbacher (2004): Third Party Punishment and Social Norms

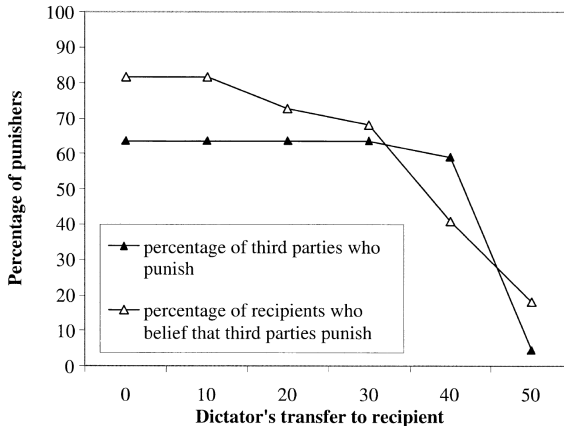
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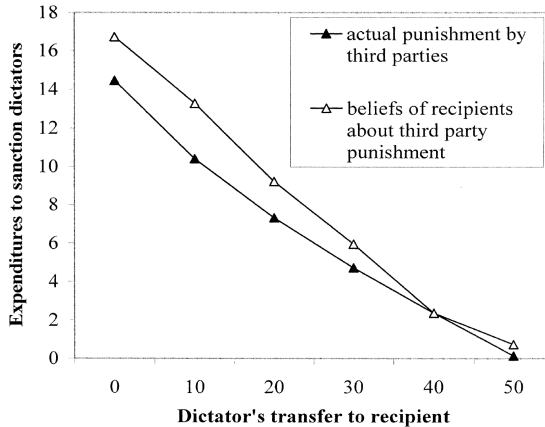
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- In experimental and natural settings, people often behave differently toward others, depending on the linguistic, ethnic, and religious groups to which they belong
- People are more willing to cooperate with in-group members than out-group members, and more willing to punish out-group members than in-group members
- The sensitivity of cooperation to group membership has been studied using the **trust game** (Berg et al., 1995)

Trust Game

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- Two players, call them Alice (the “truster”) and Bob (the “trustee”)
- Alice is awarded a sum of money and given the opportunity to transfer any amount of it to Bob
- The experimenter then triples the amount transferred (e.g., if Alice gives 10, Bob receives 30)
- Bob then has the opportunity to return some of this augmented sum to Alice
- This ends the game

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- If Alice cared only about payoffs, and assumed that Bob had the same self-regarding preferences, she would transfer nothing
- She would correctly infer that whatever Bob received would be kept rather than returned
- But when the game is played anonymously, Alice typically contributes a significant amount, and significant amounts are returned by Bob

Trust Game

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- Several experimenters have implemented the trust game played between subjects who were—while otherwise anonymous—aware of the ethnic, religious, or linguistic identity of their partner
- Fershtman et al. (2002) implemented this game in Belgium, played between students at Flemish and Walloon universities
- Both Flemish and Walloon Alices make lower offers to out-group than in-group members
- However, they offer as much to a partner of unknown in-group/out-group status as they do to in-group members
- Such discriminatory preferences are a puzzle, as they often impel people to forego beneficial exchanges

8. People Enjoy Cooperating And Punishing Free Riders

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- There is evidence from neuroimaging studies that people enjoy cooperating and punishing those who violate norms of fairness
- Ultimatum game responders who reject a low offer exhibit heightened activation of the bilateral anterior insula (Sanfey et al. 2003)
 - a neural locus of the distaste for inequality and unfair treatment?
- Mutual cooperation and a monetary payoff enhances activity in the striatum more than the same payoff resulting from performance of an individual task (Rilling et al., 2004)
- Subjects who punished partners that had violated their trust exhibited enhanced activation of the dorsal striatum (De Quervain et al., 2004)

9. Ecological Validity

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- Do experimental results in the laboratory reflect real-life behaviour?
- There is some evidence that they do have *external validity*
- Carpenter and Seki (2011):
 - Japanese shrimp fishermen
- Leibbrandt et al. (2010):
 - Inland and ocean fishermen in Brazil
- Fehr and Leibbrandt (2010):
 - Brazilian shrimp fishers
- Rustagi et al. (2010):
 - Forest commons management

Summary & Conclusions

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- Results are at variance with the self-interest axiom of the standard economic model
- Many people are willing to sacrifice their own monetary payoff to increase that of others (*ultimatum game, trust game, public goods game*)
- Many people reciprocate kind acts with kinds acts of their own (*trust game, prisoners' dilemma*)
- Many people reciprocate hostile acts with hostile acts of their own (*ultimatum game, public goods game, public goods with punishment game, dictator game with third party punishment*)

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- There is ubiquitous evidence of social preferences (*all games*)—many people are generous toward others, care about fairness, and seek to avoid inequality
- The standard economic model must therefore be augmented to take these social preferences into consideration