AREC 815: Experimental and Behavioral Economics

Simple Distributional Preference Experiments Show that Humans Are Not Always Perfectly Selfish

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4 Simple Experiments

Distributional Preferences

Common sense:

> "...the kind of finding that only surprises economists..."

People are not **strictly** self-interested; we are (sometimes):

- Generous
- Spiteful
- Opposed to inequality
- Competitive
- Trustworthy

Distributional Preferences

An agent, i, has **distributional** (or **social**) **preferences** if consumption by, or the utility of, another individual enters into i's utility function

- We all have social preferences — how should we model them?
- Which aspects of choice behavior result from distributional *preferences*, and which result from other strategic social concerns?

Easier to "turn off" strategic interpersonal considerations in controlled, potentially anonymous environment of the experimental lab

- Evidence from simple games in the lab

Distributional Preferences

4 experiments demonstrating that people are not purely self-interested:

- Dictator games (DG)
- Ultimatum games (UG)
- Public goods games (PG)
- Trust games (TG)

Dictator Games

Player 1
receives an endowment of 10 tokens

Player 2
receives nothing

Player 1
chooses an amount $x \in [0, 10]$ to allocate to **Player 2**

Final payoffs:

Player 1: $10 - x$

Player 2: x

Prediction of the "standard" model:

Dictator Games

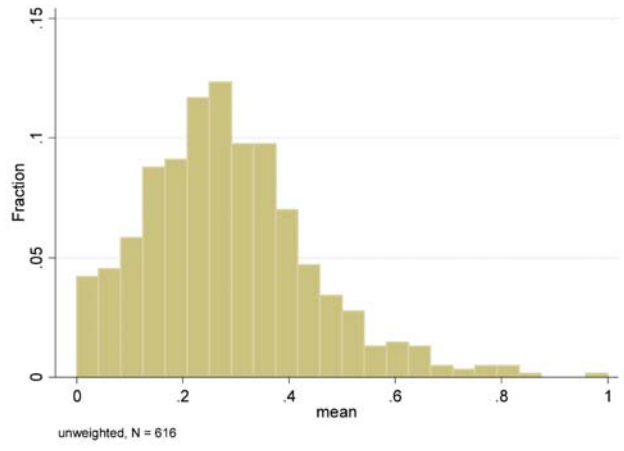
Dictators are not completely selfish.

Three meta-analyses provide an overview of the hundreds of DG experiments that have been conducted around the world:

- Camerer (2003) reports mean offers in the range of 10–30 percent
  - Allocations are lower (but still positive) in double-blind treatments
  - Allocations are higher when recipients are less anonymous
  - Allocations are higher in hypothetical treatments
- Cardenas and Carpenter (2008) survey DGs in developing countries and report higher mean offers, ranging from 25 to 50 percent
- Engel (2011) surveys 131 papers including a total of 616 treatments

Dictator Games

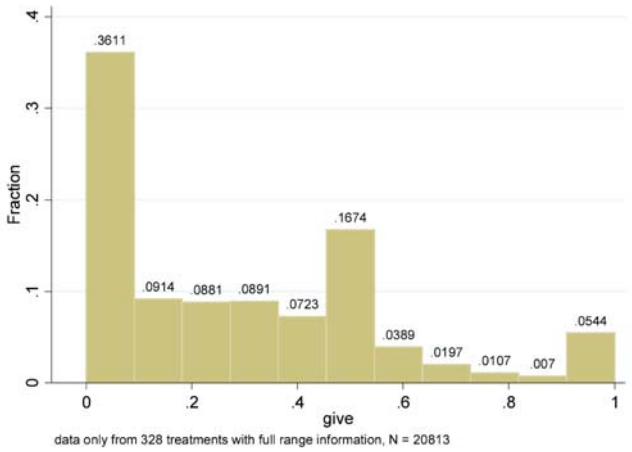
Distribution of **average** budget share allocated to other subject:



Source: Engel (2011)

Dictator Games

Distribution of **individual-level** allocations to other subject:



Source: Engel (2011)

Dictator Games: Takeaways

Main factors predicting allocations to other subject (Engel 2011):

- Earned property rights (both the dictator's and the recipient's)
- Giving to a "deserving" recipient (e.g. a charity)
- Being a student

Some people are completely selfish, but most people are not

- Fairminded and intermediate types outnumber *homo economicus*
- Modes at 0 and 50 percent are typical

Ultimatum Games

Player 1
receives an endowment of 10 tokens

Player 2
receives nothing

Player 1
proposes an allocation $(\pi_1, \pi_2) = (10 - x, x)$ to **Player 2**

Player 2
decides whether to accept or reject the proposed allocation

Final payoffs:

Player 1: $10 - x$ if **Player 2** accepts, and 0 otherwise

Player 2: x if **Player 2** accepts, and 0 otherwise

Ultimatum Games

UG first proposed by Güth-Schmittberger-Schwarze (1982)

- UG predates DG
- DG proposed as a way of exploring the motives of Player 1

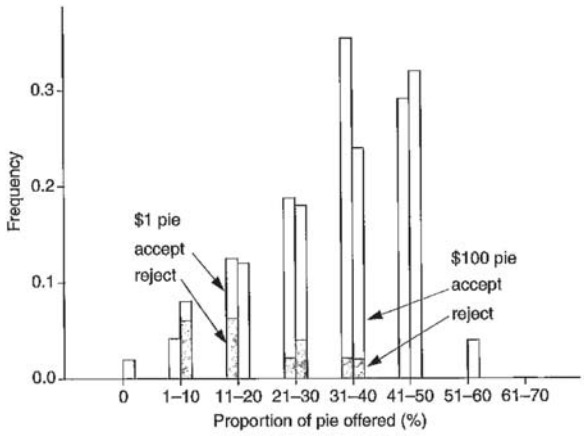
Prediction of the standard model:

- **Player 1**
- **Player 2**

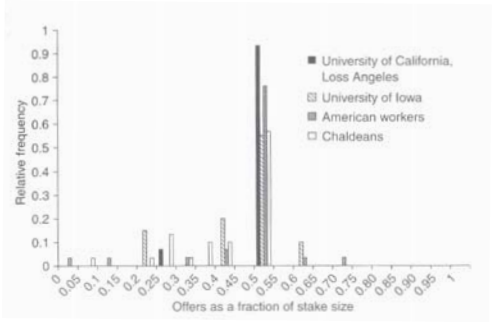
What would non-economists predict?

- Do we expect **Player 2** to accept the lowest possible offer?
- So, how should a rational **Player 1** proceed?

Ultimatum Games



Ultimatum Games



Camerer (2003) summarizes 16 early papers — different stakes, different subject pools, different protocols, different countries, etc.

- Offers: mode 40 to 50 percent of budget, mean 30 to 50 percent
- Offers below 20 percent rejected about half the time

Ultimatum Games: Takeaways

Behavior does not conform to the standard model of self-interest

- Players (specifically, those in the position of **Player 2**) punish jerks — i.e. they are motivated by spite or **negative reciprocity**
- Subjects assigned to the role of **Player 1** anticipate this, and rein in their tendency toward selfishness to increase their expected payoff

Subjects in the role of **Player 1** may also be motivated by altruism, but UG experiments don't allow for a clean test of such motivations

Public Goods Games

Players (typically 4) are each endowed with 20 tokens

Each player chooses $c_i \in [0, 20]$ to allocate to shared account

- Contributions to shared account multiplied by factor $m > 1$
- Funds not allocated to shared account remain in private account

Final payoffs:

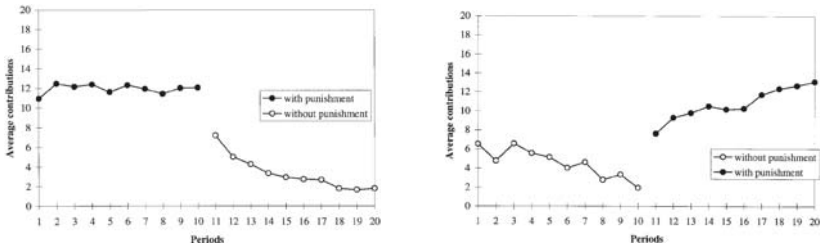
- Player i receives: $20 - c_i + m\left(\sum_n c_n\right)/N$

Prediction of the standard model:

- Optimal strategy:

Public Goods Games

Results from a repeated PG game (Fehr-Gaechter 2000)



Public Goods Games: Takeaways

PG games are often repeated for a finite number of periods

- Contributions generally decline over time

Many experiments allow subjects to punish others in their group

- Contrary to standard model, subjects also engage in costly punishment of non-cooperators in finitely-repeated PG games
- The threat of punishment increases contribution levels

Main stylized fact:

- Evidence suggests many subjects are **conditional cooperators**
- Many subjects willing to pay to enforce cooperative norms

Trust Games

Player 1
receives an endowment of 10 dollars

Player 2
receives nothing

Player 1
chooses an amount $x \in [0, 10]$ to send to **Player 2**

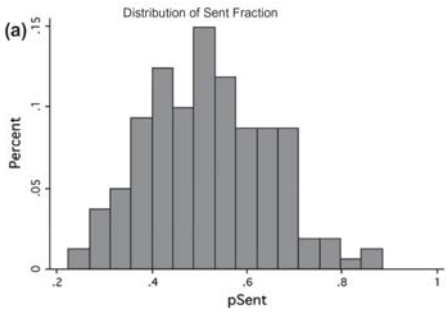
Player 2
receives $3x$
and chooses an amount $y \in [0, 3x]$ to send back to **Player 1**

Final payoffs:

Player 1: $10 - x + y$

Player 2: $3x - y$

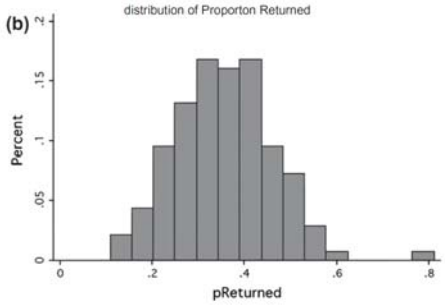
Trust Games: Takeaways



Player 1 typically sends some money, but not all the money

- Trust? A lack of trust?
- Risk aversion? Uncertainty about expected return?

Trust Games: Takeaways



Player 2 typically returns. . .

$\Rightarrow$ So,

Lessons from Simple Experiments

Lessons from simple experiments:

- **Dictator games:** many people choose to reduce their own payoff to increase the payoff of an (otherwise worse-off) other
- **Ultimatum games:** people choose Pareto-dominated equal outcomes (zero payoffs) over highly unequal payoff distributions
- **Public goods games:** many people are conditional cooperators; many are willing reduce their own payoff to punish bad behavior
- **Trust games:** many people reciprocate (potentially self-interested) kindness, but even so trust is only a so-so investment

Does Culture Matter?

Culture Matters... Sometimes

Roth *et al* (AER, 1991) conduct identical experiments in 4 countries

- Ultimatum games — repeated 10 times, stranger matching
- Market experiments involving one buyer, multiple sellers

Take great pains to address potential confounds

- Tackle potential experimenter effects head on: each "local" experimenter conducts sessions in Pittsburgh and her home country
- Address stake size concerns by conducting sessions in Pittsburgh with a standard stake-size (10 USD) and a larger pie (30 USD)
- Work together to arrive at English version of instructions that translates into Hebrew, Japanese, and Slovenian effectively

Culture Matters. . . Sometimes

Ultimatum game results differ across countries

- Ultimatum games offers are lower in Israel and Japan
  - Modal offer is 40 percent rather than 50 percent
- Lower offers are rejected within each country, but rejection rates are lower in the U.S. and Yugoslavia (relative to Israel and Japan)

Market experiment results do not differ across countries

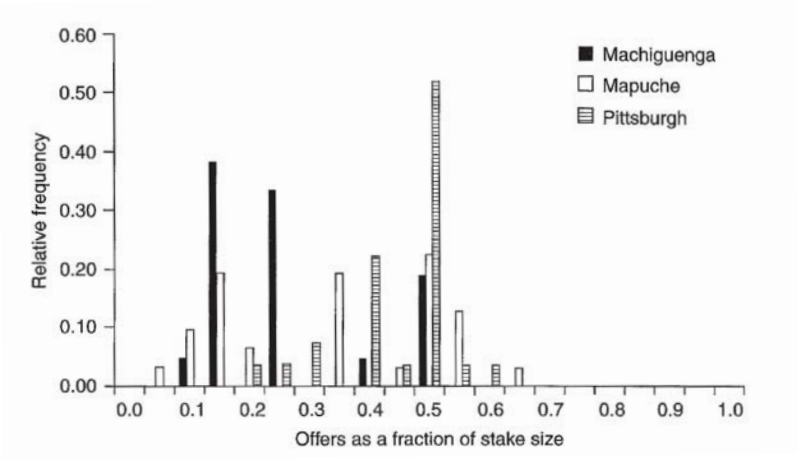
- Markets rapidly converge to equilibrium price level in all countries

Caveat: all subjects are economics students in wealthy countries

- Would results look different with a wider range of cultures?

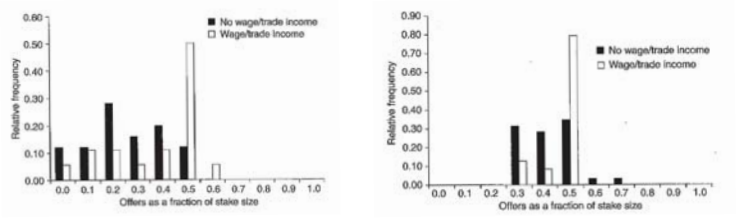
The Roots of Human Sociality

Results from Joe Henrich's UG experiment with indigenous Amazonians:

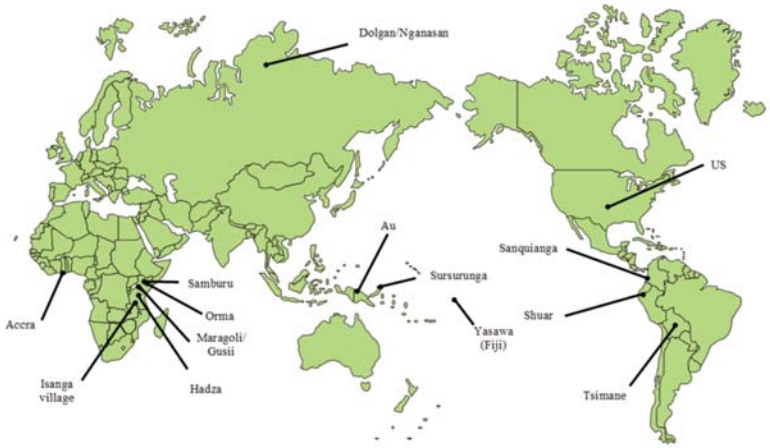


The Roots of Human Sociality

Results from Jean Ensminger's DG and UG experiments with the semi-nomadic Orma people of rural northeastern Kenya:



The Roots of Human Sociality



The Roots of Human Sociality

Henrich, Ensminger, and co-authors conduct simple distributional preference experiments in a range of societies around the world

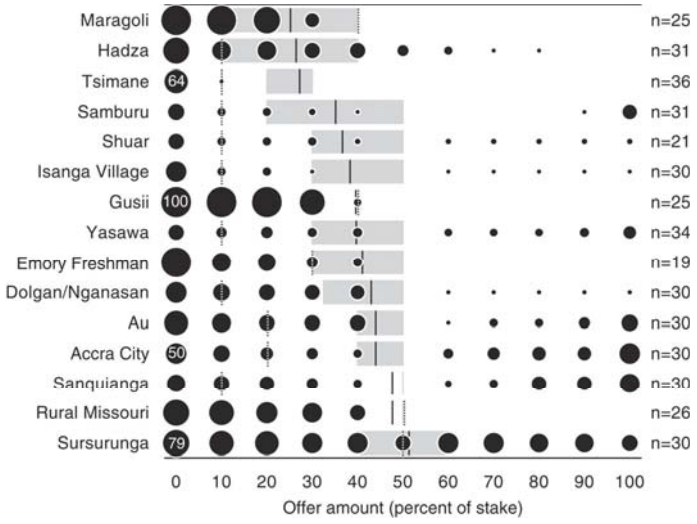
- Dictator, ultimatum, third party punishment games
- Subject populations from hunter gathers to workers in formal sector

Hypothesis: norms of fairness evolve as/because societies become more complex, personal relationships replaced by moral codes

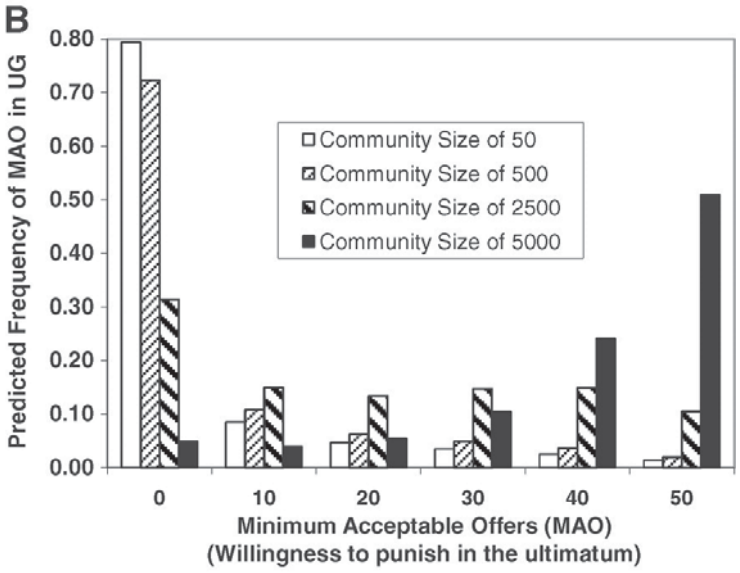
- Market integration: fraction of calorie intake purchased
- Participation in world religions alternative source of norms

Variation Across Societies

Fig. 1. UG results displayed as the distributions of rejections across possible offers in the UG, which overlay the mean offers and interquartiles.



Variation Across Societies



Market Integration and Fairness

"The efficiency of market exchange involving infrequent or anonymous transactions improves with an increasingly shared set of motivations and expectations related to trust, fairness, and cooperation. This lowers transaction costs, raises the frequency of successful transactions, and increases long-term rewards."

Market Integration and Fairness

Estimate OLS regressions:

$$Offer = \alpha + \beta MI + \gamma WR + \lambda X + \varepsilon$$

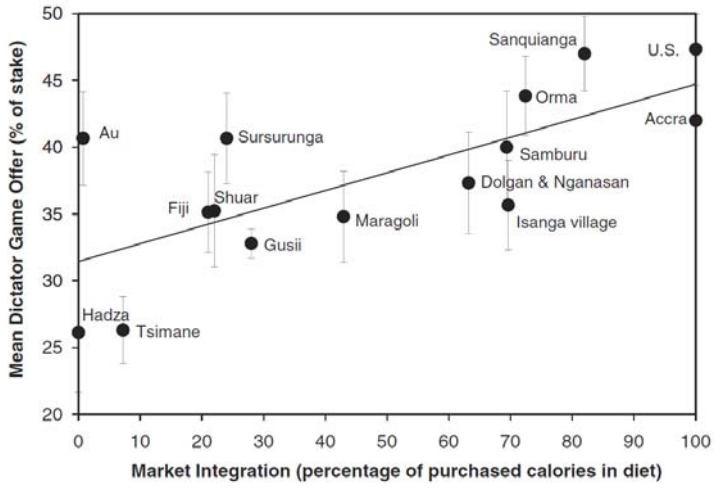
where **MI** is market integration and **WR** is world religion

Table 2. Linear regression models for offers. These ordinary least-squares models include four additional control variables (sex, age, community size, and education). Coefficients are followed by standard errors, indicated with ±; *P* values are given in parentheses.

Variables	All offers*	DG offers†	UG offers†	TPG offers†
MI	0.12 ± 0.023 (<0.001)	0.17 ± 0.035 (<0.001)	0.098 ± 0.035 (0.005)	0.11 ± 0.044 (0.044)
WR‡	5.96 ± 2.04 (0.0036)	6.4 ± 3.61 (0.079)	10.4 ± 2.67 (<0.001)	0.45 ± 3.06 (0.879)
Income (per U.S. $1000)	0.096 ± 0.089 (0.28)	−0.012 ± 0.15 (0.93)	0.16 ± 0.10 (0.13)	−2.25 ± 0.94 (0.017)
Wealth (per U.S. $1000)	0.0012 ± 0.006 (0.83)	0.0013 ± 0.008 (0.88)	−0.0056 ± 0.008 (0.43)	1.2 ± 0.25 (<0.001)
Household size	−0.24 ± 0.21 (0.24)	−0.13 ± 0.31 (0.67)	−0.24 ± 0.2 (0.37)	−1.0 ± 0.43 (0.019)
Observations; R^2	920; 0.084	336; 0.10	319; 0.14	265; 0.10

*Clustered robust standard errors adjust for repeated observations of the same people, 596 individuals (clusters). Indicator variables for each experiment (UG, TPG) were included to control for differences among offers in the three games (table S5). †Robust standard errors used. See (32) for models with clustered robust standard errors [clustering on populations (Table 1) to control for the nonindependence of individuals], continental-level controls to address any shared culture history (Model 1 in tables S8, S11, and S14), and a variety of other robustness checks, which are summarized in the text. ‡WR is an individual-level dummy variable with "1" indicating Islam or Christianity, and "0" marking the practice of a tribal religion or "no religion." We have few "no religion" responses, and ethnography suggests that in the wake of missionary activities people associate "religion" with "Christianity." Thus, responses of "no religion" probably imply belief in the local or traditional religion.

Market Integration and Fairness



Culture and Distributional Preferences: Takeaways

Distributional preferences differ across cultures:

- People from different cultures interpret unstructured bargaining experiments very differently, even when the protocols are identical
- Markets seem to shift people toward specific norms
  - Higher offers in DGs and UGs
  - Outcomes differ in UGs, but not in market experiments
- Some societies are more tolerant of self-interest than others
  - Excessive generosity is punished in some societies

Distributional Preferences: Simple Theory

Simple Models of Distributional Preferences

Lessons from simple experiments:

- **Dictator games:** many people choose to reduce their own payoff to increase the payoff of an (otherwise worse-off) other
- **Ultimatum games:** people choose Pareto-dominated equal outcomes (zero payoffs) over highly unequal payoff distributions

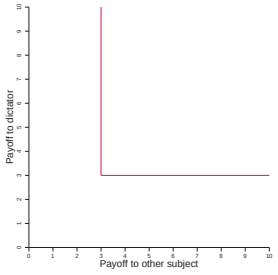
These results inspired models of **inequality aversion**:

- Fehr-Schmidt (1999): people care about their own payoffs and they seek to minimize differences between (their own and others') payoffs

Aggregating (and Modeling) the Evidence

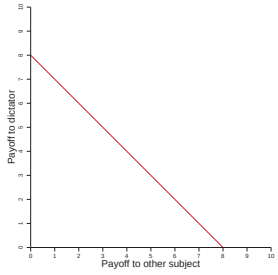
Rawlsian distributional preferences:

$$u(\pi_a, \pi_b) = \min\{\pi_a, \pi_b\}$$



Utilitarian distributional preferences:

$$u(\pi_a, \pi_b) = \pi_a + \pi_b$$



Aggregating (and Modeling) the Evidence

1. Equality-efficiency tradeoffs
   - Rawlsianism and utiliarianism: two ends of an elasticity spectrum
2. Do intentions matter?
   - Reciprocity? Positive or negative?
3. Notions of fairness: are people getting what they deserve?
4. Preferences over processes, agency, voice, etc.

Simple Models of Distributional Preferences

Charness-Rabin (2002) suggest more nuanced range of theories:

- **Inequality aversion:** "people prefer to minimize disparities between their own monetary payoff and those of other people"
- **Social welfare:** "people like to increase social surplus, caring especially about those (themselves or others) with low payoffs"
- **Competitive preferences:** people prefer to consume as much as possible, but also care about their relative status compared to others
- **Reciprocal preferences:** "the desire to raise or lower others' payoffs depends on how fairly those others are behaving"

Simple Models of Distributional Preferences

Simple, stylized model of subjects' social preferences:

Player B's preferences can be represented by the utility function

$$u_b(\pi_a, \pi_b) = (\rho \cdot r + \sigma \cdot s)\,\pi_a + (1 - \rho \cdot r - \sigma \cdot s)\,\pi_b$$

with the model parameters defined as follows:

- π_a, π_b are payouts to a, b respectively
- $r = 1$ if $\pi_b \geq \pi_a$, zero otherwise
- $s = 1$ if $\pi_b < \pi_a$, zero otherwise

Simple Models of Distributional Preferences

Simple, stylized model of subjects' social preferences:

Player B's preferences can be represented by

$$u_b(\pi_a, \pi_b) = (\rho \cdot r + \sigma \cdot s)\,\pi_a + (1 - \rho \cdot r - \sigma \cdot s)\,\pi_b$$

- **Competitive preferences**: $\sigma \leq \rho \leq 0$
- **Inequality aversion**: $\sigma < 0 < \rho < 1$
- **Social welfare**: $0 < \sigma \leq \rho \leq 1$

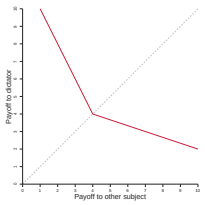
Compare predictive power using "simple tests" — binary choices

- Player B simply chooses between two possible allocations, (π_a, π_b)

Simple Models of Distributional Preferences

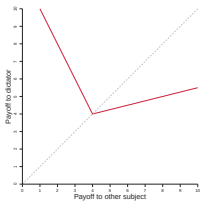
Social Welfare

$0 < \sigma \leq \rho \leq 1$



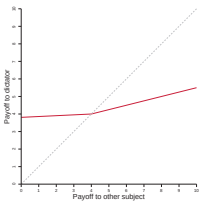
Inequality Aversion

$\sigma < 0 < \rho < 1$

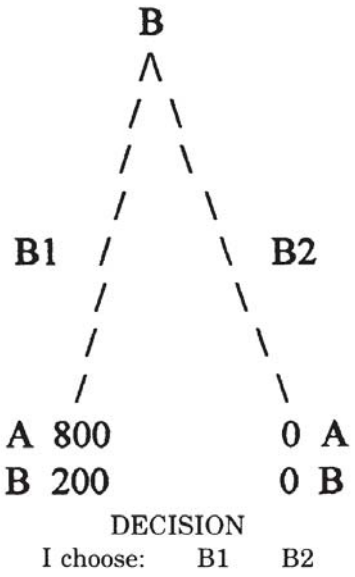


Competitive

$\sigma \leq \rho \leq 0$



Testing the Models: Experiments



Testing the Models: Experimental Results

Player B's Choice			Left	Right
$(800, 200)$	vs.	$(0, 0)$	1.00	0.00
$(0, 800)$	vs.	$(400, 400)$	0.78	0.22
$(400, 400)$	vs.	$(750, 400)$	0.31	0.69
$(400, 400)$	vs.	$(750, 375)$	0.51	0.49
$(300, 600)$	vs.	$(700, 500)$	0.67	0.33
$(200, 700)$	vs.	$(600, 600)$	0.27	0.73

Testing the Models: Experimental Results

Observed decisions consistent with:

Self Interest	68%
Competitive Preferences	60%
Inequality Aversion	75%
Social Welfare	97%

Comparing the fit of the models:

- Least support for competitive preferences
- More support for social welfare than inequality aversion
- Many subjects appear to trade off self interest, social welfare

Fitting the Model

Model	Restrictions	ρ	σ	LL
Self-interest	$\rho = \sigma = 0$			-593.4
Altruism	$\rho = \sigma$	0.212^{***}	0.212^{***}	-574.5
Behindness aversion	$\rho = 0$		0.118^{*}	-591.5
Charity	$\sigma = 0$	0.422^{***}		-527.9
Two-parameter model		0.423^{***}	-0.014	-527.7

Reciprocity?

Q: Does Player B reward helpful actions by Player A?

A: Sometimes...

	$(400, 400)$	$(750, 400)$
B chooses $(400, 400)$ or $(750, 400)$	0.31	0.69
A chooses $(750, 0)$ or lets B choose	0.06	0.94

	$(0, 800)$	$(400, 400)$
B chooses $(0, 800)$ or $(400, 400)$	0.78	0.22
A chooses $(800, 0)$ or lets B choose	0.45	0.55

Reciprocity?

Q: Does Player B reward helpful actions by Player A?

A: Sometimes... but not always

	(400, 400)	(750, 375)
B chooses (400, 400) or (750, 375) (Spain)	0.52	0.48
B chooses (400, 400) or (750, 375) (US)	0.50	0.50
A chooses (725, 0) or lets B choose (Spain)	0.62	0.38
A chooses (800, 0) or lets B choose (Spain)	0.62	0.38
A chooses (750, 0) or lets B choose (Spain)	0.61	0.39

Concern withdrawal: we put greater weight on the powerless

More true when helping others is costly?

Reciprocity?

Q: Does Player B punish unhelpful actions by Player A?

A: Yes!

	(400, 400)	(750, 375)
B chooses (400, 400) or (750, 375) (Spain)	0.52	0.48
B chooses (400, 400) or (750, 375) (US)	0.50	0.50
A chooses (550, 550) or lets B choose (Spain)	0.93	0.07
A chooses (550, 550) or lets B choose (US)	0.82	0.18

Reciprocity?

Q: Does Player B punish unhelpful actions by Player A?

A: Yes!

	$(800, 200)$	$(0, 0)$
B chooses $(800, 200)$ or $(0, 0)$	1.00	0.00
A chooses $(500, 500)$ or lets B choose	0.91	0.09
A chooses $(750, 750)$ or lets B choose	0.88	0.12

Distributional Preferences: Summary

Lessons from simple experiments:

- Many (most?) people are not completely selfish
- People sacrifice their own payoffs to help those who are worse off
  - Particularly those with little agency
  - Particularly when it is efficient to do so
- Most people care more about their own payoffs than those of others
  - People put very little weight on better-off players
- Many people want to punish bad behavior by others, even at a cost
  - People are much less willing to reward helpful behavior