

Econ 219B

Psychology and Economics: Applications (Lecture 8)

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Outline

- 1 Social Preference Wave III: Reciprocity and Gift Exchange
- 2 Gift Exchange: Workplace
- 3 Gift Exchange: Charitable Giving
- 4 Social Preferences Wave IV: Social Pressure, Signaling, and Social Norms
- 5 Social Pressure: Various
- 6 Social Pressure: Charitable Giving
- 7 Social Signaling

Section 1

Social Preference Wave III: Reciprocity and Gift Exchange

Model

- Take simple altruism model:

$$U = u(x_s) + \alpha u(x_o)$$

- Reciprocity models: Assume that α depends on actions, or intentions, of other player
 - Positive reciprocity: α higher if treated nicely
 - Negative reciprocity: α lower if treated unfairly
 - More evidence of the latter in lab experiments
- Models of reciprocity differ in whether α depends simply on actions, or intentions

Section 2

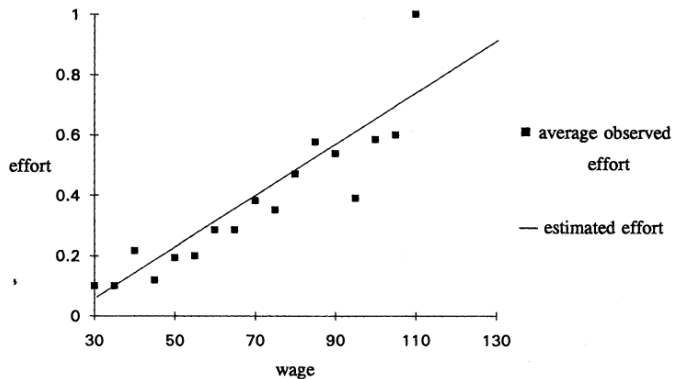
Workplace: Gift Exchange

Laboratory evidence

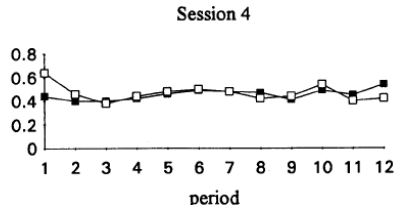
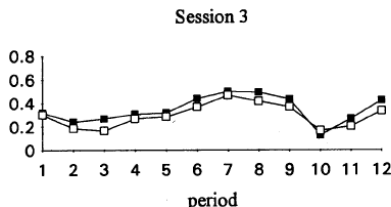
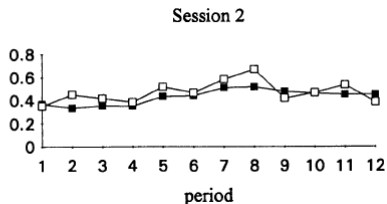
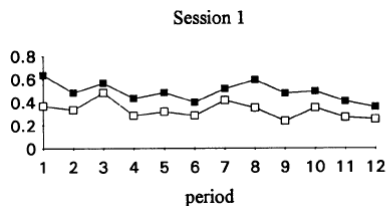
- **Fehr-Kirchsteiger-Riedl (QJE, 1993).**
 - 5 firms bidding for 9 workers
 - Workers are first paid $w \in \{0, 5, 10, \dots\}$ and then exert effort $e \in [.1, 1]$
 - Firm payoff is $(126 - w) e$
 - Worker payoff is $w - 26 - c(e)$, with $c(e)$ convex (but small)
- Standard model: $w^* = 30$ (to satisfy IR), $e^*(w) = .1$ for all w

Findings

- Effort e increasing in w and $Ew = 72$



Findings Stable over Time



—■— average relative overpayment —□— average effort

Which model explains this behavior?

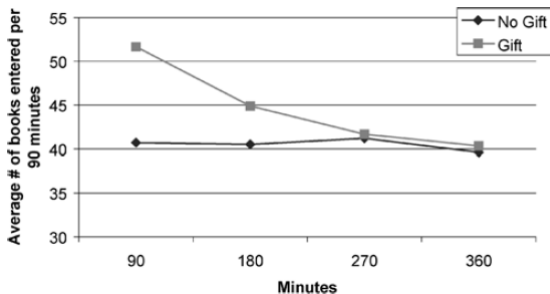
- **Fehr-Schmidt (1999)** propose: *Inequity aversion* ($\rho > 0 > \sigma$)
 - Initially, firm is ahead in payoffs
 - Assume firm pays minimum wage
 - Firm still ahead in payoffs
 - Worker does not care for firm given $\sigma < 0$
 - \rightarrow Worker does not want to exert effort to benefit the firm
 - Assume now firm pays generous wage towards worker
 - Firm is *now* behind in payoffs
 - Worker now cares for firm given $\rho > 0$
 - \rightarrow Worker exerts effort to decrease (advantageous) inequality
 - The higher the wage, the larger the transfer given mechanism above

Alternative model: *Reciprocity*

- Worker cares about firm with weight α
- Altruism weight is a function of how nicely workers has been treated
- Positive gift increases α
- \rightarrow Worker puts more effort because he cares more about firm
- The higher the wage, the larger the transfer given mechanism above

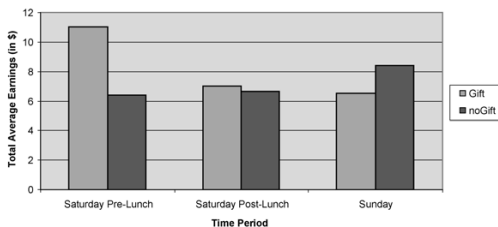
Gift Exchange in the Field

- Evidence of gift exchange in a field workplace?
- **Gneezy-List (EMA, 2006)** → Evidence from labor markets
- *Field experiment 1*. Students hired for one-time six-hour (typing) library job for \$12/hour
 - No Gift group paid \$12 ($N = 10$)
 - Gift group paid \$20 ($N = 9$)



Gift Exchange in the Field

- *Field experiment 2*. Door-to-Door fund-raising in NC for one-time weekend for \$10/hour
 - Control group paid \$10 ($N = 10$)
 - Treatment group paid \$20 ($N = 13$)

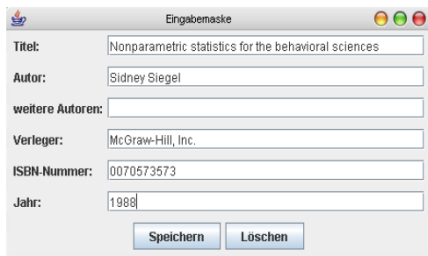


- Note: Group coming back on Sunday is subset only (4+9)
- Evidence of reciprocity, though short-lived

Positive vs. Negative Reciprocity

- Laboratory evidence: negative reciprocity stronger than positive reciprocity
- Test for positive versus negative reciprocity in the field?
- **Kube-Marechal-Puppe (JEEA 2013).**
- Field Experiment: Hire job applicants to catalog books for 6 hours

Figure 2: Screenshot: Computer Application



The screenshot shows a window titled "Eingabemaske" with the following fields and values:

Field	Value
Titel:	Nonparametric statistics for the behavioral sciences
Autor:	Sidney Siegel
weitere Autoren:	
Verleger:	McGraw-Hill, Inc.
ISBN-Nummer:	0070573573
Jahr:	1988

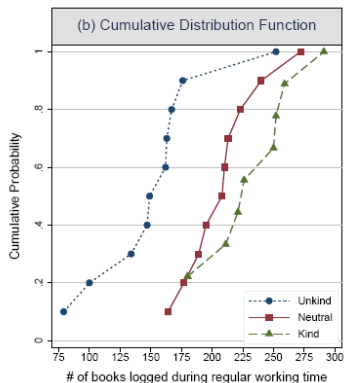
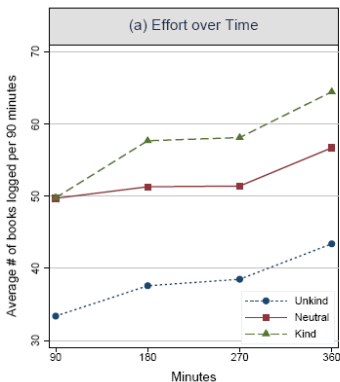
Buttons at the bottom: **Speichern** and **Löschen**.

Design

- Announced Wage: '*Presumably*' 15 Euros/hour
 - Control ($n = 10$). 15 Euros/hour
 - Treatment 1 (Negative Reciprocity, $n = 10$). 10 Euros/hour (No one quits)
 - Treatment 2 (Positive Reciprocity, $n = 9$). 20 Euros/hour
- Offer to work one additional hour for 15 Euros/hour

Results

- Result 1: Substantial effect of pay cut
- Result 2: Smaller effect of pay increase
- Result 3: No decrease over time



Results

- Finding consistent with experimental results:
 - Positive reciprocity weaker than negative reciprocity
- Important other result:
 - No negative effect on quality of effort (no. of books incorrectly classified)
 - All treatments have near perfect coding
 - Hence, negative reciprocity does not extend to sabotage
- Final result: No. of subjects that accept to do one more hour for 15 Euro:
 - 3 in Control, 2 in Pos. Rec., 7 in Neg. Rec.
 - Positive Reciprocity does not extend to volunteering for one more hour

Kube-Marechal-Puppe (AER 2011)

- Field Experiment 2: Hire job applicants to catalog books for 6 hours
- Announced Wage: 12 Euros/hour for 3 hours=36
 - Control ($n = 17$). 36 Euros
 - Treatment 1 (Positive Reciprocity, Cash, $n = 16$). $36 + 7 = 43$ Euros
 - Treatment 2 (Positive Reciprocity, Gift, $n = 15$). 36 Euros plus Gift of Thermos
 - Treatment 3 – Same as Tr. 2, but Price Tag for Thermos

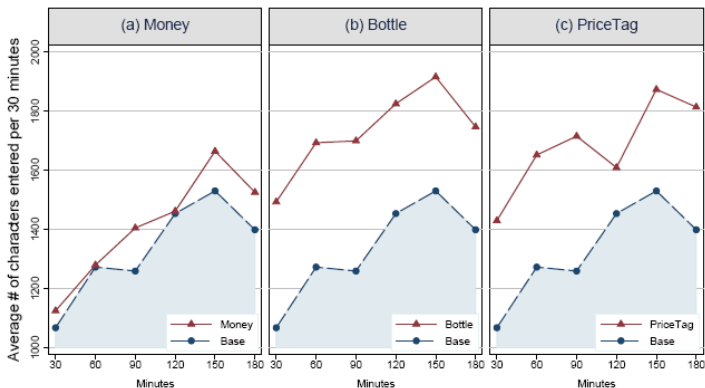
Cash vs. Gift

- What is the effect of cash versus in-kind gift?



Results

- Result 1: Small effect of 20% pay increase
- Result 2: Large effect of Thermos → High elasticity, can pay for itself
- Result 3: No decrease over time



Possible Explanations

- Explanation 1. Thermos perceived more valuable
 - → But Treatment 3 with price tag does not support this
 - Additional Experiment:
 - At end of (unrelated) lab experiment, ask choice for 7 Euro or Thermos
 - 159 out of 172 subjects prefer 7 Euro
- Explanation 2. Subjects perceive the thermos gift as more kind, and respond with more effort
- Tentative conclusions from gift exchange experiments:
 - 1 Gift exchange works in lab largely as in field
 - 2 Negative reciprocity stronger than positive reciprocity (as in lab)
 - 3 Effect is sensitive to perception of gift

Model-Based Explanations

- BUT: Think harder about these conclusions using **models**
- **Conclusion 1.** Gift exchange works in lab as in field
- Fehr, Kirchsteiger, and Riedl (QJE, 1993) - Two main model-based explanations:
 - *Inequity Aversion* (Fehr and Schmidt, 1999): Worker puts effort because firm had fallen behind in payoffs by putting effort
 - *Reciprocity* (Rabin, 1993; Dufwenberg and Kirchsteiger, 2003): Worker is nice towards firm because firm showed nice intentions

- Model for Gneezy and List (2006) and follow-up work?
 - Inequity aversion does *not* predict gift exchange in the field (Card, DellaVigna, and Malmendier, JEP 2011)
 - Firm is very likely to have substantial income M , more than worker
 - When firm transfers gift to employee, firm is still ahead on payoffs
 - → No predicted effort response
 - Intuition: Firm does not fall behind the worker just because of a pay increase

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 - Intuition: Firm does not fall behind the worker just because of a pay increase
- Hence, gift exchange in the field, when occurs, is due to reciprocity, not inequity aversion

- **Conclusion 2.** Negative reciprocity stronger than positive reciprocity
 - Is that really implied?
- Pure-altruism model of utility maximization of worker in gift exchange experiment

$$\max_e u(e) = w - c(e) + \alpha [ve - w]$$

- e is effort, measurable
 - w is fixed payment (could be a gift)
 - $c(e)$ is cost of effort
 - α is altruism coefficient
 - v is return to the firm for unit of effort
- Would like to estimate α , and how it changes when a gift is given

- Utility

$$\max_e u(e) = w - c(e) + \alpha [ve - w]$$

- First-order condition:

$$-c'(e^*) + \alpha v = 0$$

- Can we estimate α ?

- Utility

$$\max_e u(e) = w - c(e) + \alpha [ve - w]$$

- First-order condition:

$$-c'(e^*) + \alpha v = 0$$

- Can we estimate α ?

- Two key unobservables:

- Value of work v : What is the value of one library book coded?
- Cost of effort $c(e)$: How hard it is to work more on the margin?

- Second issue confounds conclusion on reciprocity

- Positive reciprocity may be stronger than negative, but marginal cost of effort steeply increasing \rightarrow Find stronger response to negative gift

DellaVigna, List, Malmendier, and Rao (2016)

- Address Issue 1 by informing of value of work to employer
- Address Issue 2 by estimating cost of effort function with piece rate variation
- Only then introduce gift treatments
- Introduce piece rate in design. Utility

$$\max_e u(e) = w + pe - c(e) + \alpha [ve - pe - w]$$

- First-order condition:

$$p - c'(e^*) + \alpha [v - p] = 0$$

- Notice

$$\frac{\partial e^*}{\partial p} = -\frac{1 - \alpha}{-c''(e)}$$

and

$$\frac{\partial e^*}{\partial v} = -\frac{\alpha}{-c''(e)}$$

- Hence, can estimate α given

$$\frac{\partial e^*}{\partial v} / \frac{\partial e^*}{\partial p} = \frac{\alpha}{1 - \alpha}$$

- We vary piece rate p as well as return v

Logistics I

- Recruit for a one-time, 5-hour job
- Task is to fold letters, stuff into appropriate envelope, and attach mailing address
- Task is simple, but not implausible for a temp worker
- Workers are working for a charity which pays them X per envelope
- Workers are told the (expected) return Y to the charity
- **Example:** “The envelopes filled in this session will be used in a letter campaign of Breakthrough. As mentioned before, Breakthrough will be paying for your work. The pay is \$0.20 per envelope completed, as noted on your schedule. A number of such campaigns have been run by charities similar to Breakthrough, and historically, these charities have gotten roughly \$0.30 per mailer with such campaigns. Taking account of Breakthrough per-envelope payment for your help today, it expects to get roughly \$0.10 for each additional envelope that you prepare during this session.”

Logistics II

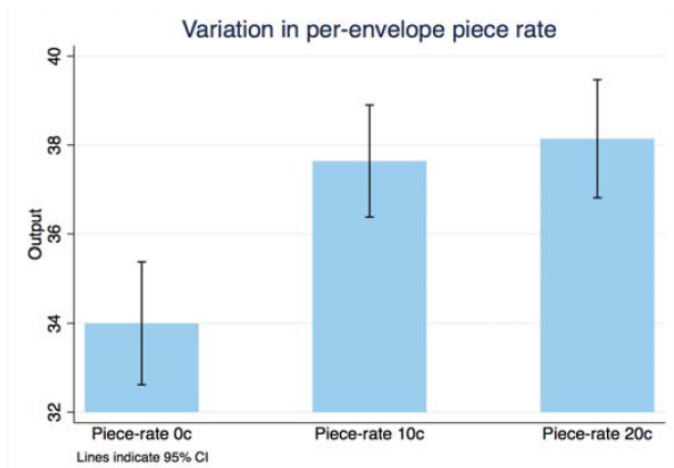
- To estimate cost of effort, we vary the piece rate within person
 - Ten 20-minute periods of folding envelopes with 5 min breaks
 - We vary the piece rate X (0 cents vs. 10 cents vs. 20 cents)
 - We vary the return to charity Y (30 cents vs. 60 cents)
 - We introduce training sessions where output is discarded
 - Subjects work for three different charities (and a firm)

Logistics III

- In last 2 periods, we introduce a gift:
 - Control group – paid \$7 flat pay as before
 - Positive gift – paid \$14
 - Negative gift – paid \$3
 - Gift sessions are observed both with high and low return to firm
 - This design allows us to estimate all parameters

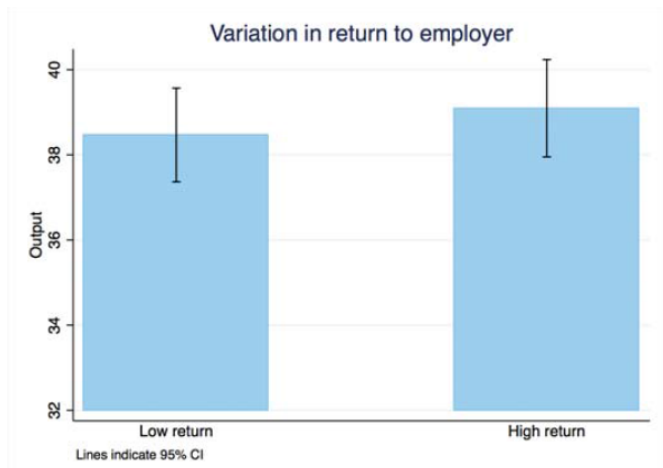
Finding 1

- Significant response to piece rate



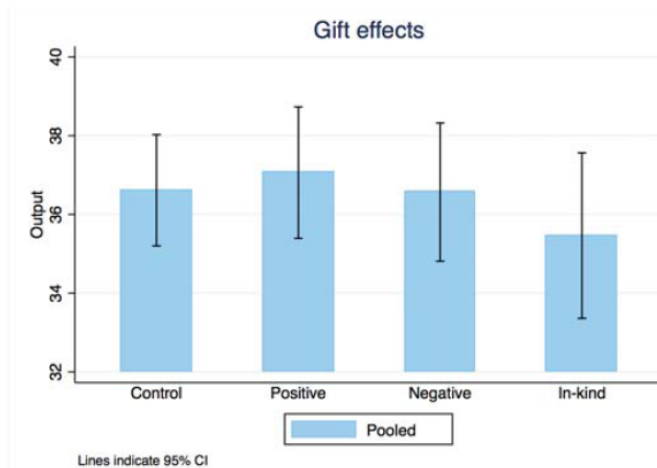
Finding 2

- Finding 2. Very small impact of match



Finding 3

- No significant impact of any of the gifts

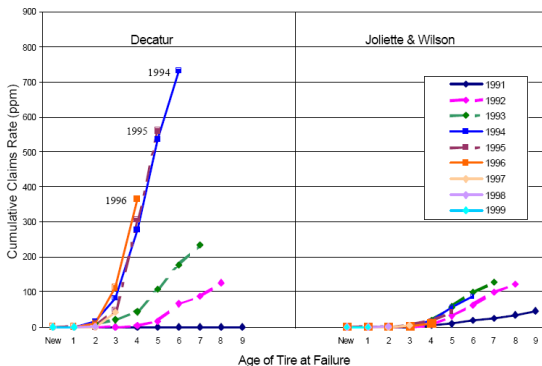


Negative Reciprocity: Sabotage?

- Is there evidence in a workplace of negative reciprocity towards unkind employer leading to sabotage?
- **Krueger-Mas (JPE, 2004).**
- Setting:
 - Unionized Bridgestone-Firestone plant
 - Workers went on strike in July 1994
 - Replaced by replacement workers
 - Union workers gradually reintegrated in the plant in May 1995 after the union, running out of funds, accepted the demands of the company
 - Agreement not reached until December 1996

Sabotage?

- Do workers sabotage production at firm?
 - Examine claims per million tires produced in plants affected
 - Compare to plant not affected by strike (Joliet & Wilson)

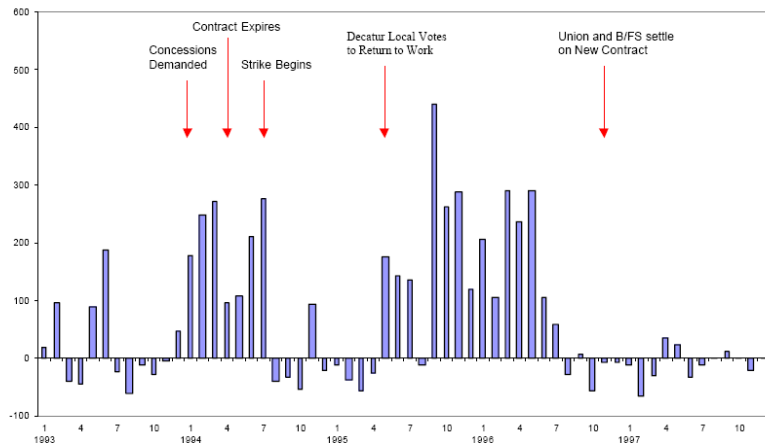


Sabotage?

- Ten-fold increase in number of claims
- Similar pattern for accidents with fatalities
- Possible explanations:
 - Lower quality of replacement workers
 - Boycotting / negative reciprocity by unionized workers
- Examine the timing of the claims

Claims Timing

Figure 8: Difference in the Number of Complaints per million Tires Produced by Month: Decatur Plant minus Joliette and Wilson Plants.



Source: Authors' calculations based on NHTSA complaints data. Records with missing data are excluded.

Claims Timing

- Two time periods with peak of claims:
 - Beginning of Negotiation Period
 - Overlap between Replacement and Union Workers
- Quality not lower during period with replacement workers
- Quality crisis due to Boycotts by union workers
- Claims back to normal after new contract settled
- Suggestive of extreme importance of good employer-worker relations

Section 3

Charitable Giving: Gift Exchange

Fund-raising

- **Falk (EMA, 2008)** — field experiment in fund-raising
 - 9,846 solicitation letters in Zurich (Switzerland) for Christmas
 - Target: Schools for street children in Dhaka (Bangladesh)
 - 1/3 no gift, 1/3 small gift 1/3 large gift
 - Gift consists in postcards drawn by kids
 - Do gifts trigger higher generosity?

Example Postcard

Appendix: An example of the included postcards



Short-Run Donation Probability

- Short-Run effect: Donations within 3 months

TABLE 1: DONATION PATTERNS IN ALL TREATMENT CONDITIONS

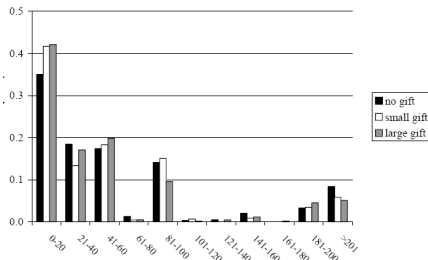
	No gift	Small gift	Large gift
Number of solicitation letters	3,262	3,237	3,347
Number of donations	397	465	691
Relative frequency of donations	0.12	0.14	0.21

- Large gift leads to doubling of donation probability
- Effect does not depend on previous donation pattern (donation in previous mailing)
- Note: High donation levels, not typical for US

Donation Amount

- Small decrease in average donation, conditional on donation (Marginal donors adversely selected, as in 401(k) Active choice paper)

FIGURE 1: HISTOGRAMS OF DONATIONS FOR EACH TREATMENT



- Limited intertemporal substitution. February 2002 mailing with no gift. Percent donation is 9.6 (control), 8.9 (small gift), and 8.6 (large gift) (differences not significant)

Section 4

Social Preferences Wave IV: Social Pressure, Signaling, and Social Norms

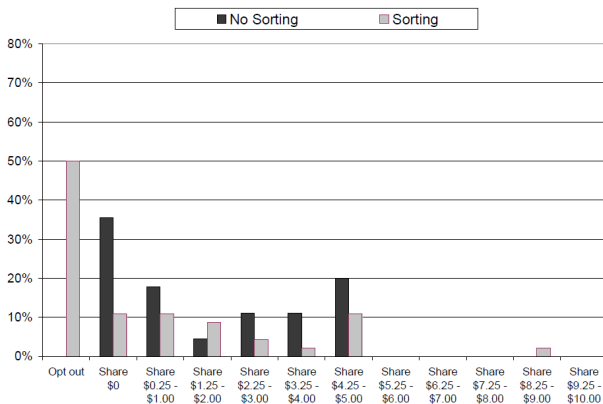
Introduction

- Last 15 years: Evidence to suggest that altruism/warm glow/inequity aversion/reciprocity only part of story
- Dictator games with sorting (**Dana, Cain, and Dawes, 2007; Lazear, Malmendier, and Weber, AEJ Applied 2012**):
 - Subject can play dictator game (\$10 to share)
 - OR can sort out and have privately \$10
- Predictions of models of altruism/warm glow/inequity aversion/reciprocity:
 - Individuals who offer 0 still would offer 0 or sort out
 - Individuals who give to other would stay in and give

Results?

- From Lazear, Malmendier, and Weber (2012)

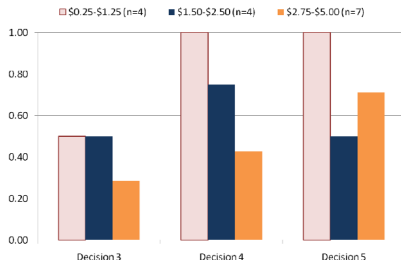
**Figure 1A. Distributions of Amounts Shared
(Experiment 1, Berkeley)**



Results?

- More than half of positive givers sort out instead!
- Need to increase dictator game payout to \$12 (Decision 5) to lure givers back!

Figure 2A. Proportion of Reluctant Sharers Choosing to Enter by Decision and Initial Amount Shared (Anonymity)



- Further evidence: Dictator games with moral wriggle room (Dana, Weber, and Kuang, 2007)
 - Avoid (free) information to justify not sharing

Social Pressure

- **DellaVigna, List, and Malmendier (QJE 2012)**
 - Pay a disutility cost $S > 0$ if do not give when asked
 - No disutility cost if can avoid to meet the solicitor or recipient
 - Give mostly *because asked*
- Can explain:
 - Sort out in dictator game with sorting
 - Wanting to ignore information
 - Give small amount to charities, no crowd out of giving
 - Also: Give more in higher social pressure environments
- Key prediction specific to Social Pressure model:
 - *Altruism/Glow*: Agent seeks giving occasions to get warm glow
 - *Social Pressure*: Agents avoids giving occasions to avoid social pressure
- Drawback of model
 - Social Pressure cost is reduced form

Signaling

- **Benabou and Tirole (2003):**

$$U = u(x_s) + \alpha u(x_o) + \lambda_\alpha E(\alpha | x_s)$$

- Individuals have an altruism weight α
 - Individuals 'forget' their altruism α
 - They infer α from their own behavior in a signaling game
 - They care about the inferred α with social signaling weight λ_α
 - Behave generously to convince one self (and others)
- Can explain:
 - People behave generously when observed, less so when no one sees (dictator with exit)
 - Small donations to signal generosity to others
 - Can generate crowd out of generosity with incentives (see below)
- Drawback: Can be hard to solve and estimate

Social Norms

- **Akerlof and Kranton (2003); Krupka and Weber (JEEA, 2013)**

- Utility is

$$U = u(x_s) - \gamma (x_s - \bar{x})^2$$

where \bar{x} is a prescribed social norm

- The individual pays a disutility cost from deviating from norm
 - E.g., equal sharing in dictator game (Krupka and Weber, 2013)
 - E.g., a behavior prescribed by one's identity (Akerlof and Kranton, 2003)
- Can explain:
 - People are generous in some settings, not others, if social norms prescribes so
- Drawback:
 - Need to explain where social norm comes from

Section 5

Social Pressure: Various

Introduction: Milgram Experiment

- Early experiments: *Milgram experiment* post-WWII
- Motivation: Do Germans yield to pressure more than others?
 - Subjects: Adult males in US
 - Recruitment: experiment on punishment and memory
 - Teacher asks questions, administers shock for each wrong answer
 - Initial shock: 15V
 - Increase amount up to 450V (not deadly, but very painful)
 - Learner visible through glass (or audible)
 - Learner visibly suffers and complains

Results

- ❶ 62% subjects reach 450V
 - ❷ Subjects regret what they did ex post
 - ❸ When people asked to predict behavior, almost no one predicts escalation to 450V
-
- It's not the Germans. *Most* people yield to social pressure
 - Furthermore, naivete' — Do not anticipate giving in to social pressure
 - Social Pressure likely to be important in organization and public events

Asch (1951)

- Second classical psychology experiment: **Asch (1951)**
 - Subjects are shown two large white cards with lines drawn on them
 - First card has three lines of substantially differing length on them
 - Second card has only one line.
 - Subjects are asked which of the lines in the first card is closest in length to the line in the second card
- Control treatment: subjects perform the task in isolation → 98 percent accuracy
- High social-pressure treatment: subjects choose after 4 to 8 subjects (confederates) unanimously choose the wrong answer
→ Over a third of subjects give wrong answer

Interpretations

- Social Pressure Interpretation:
 - Avoid disagreeing with unanimous judgment of the other participants
 - Result disappears if confederates are not unanimous
- Alternative interpretation: Social learning about the rules of the experiment
- Limitation: subjects not paid for accuracy

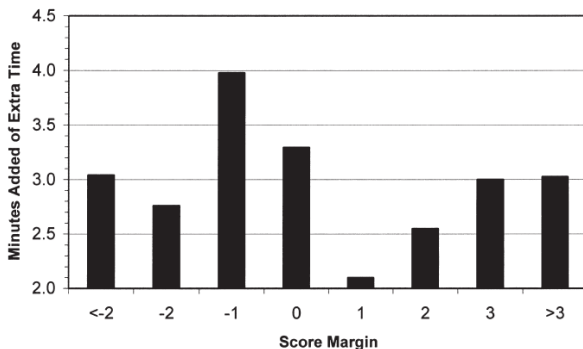
A more recent example

- An example of social pressure in a public event
- **Garicano, Palacios-Huerta, and Prendergast (REStat, 2006)**
 - Soccer games in Spanish league
 - Injury time at end of each game (0 to 5 min.)
 - Make up for interruptions of game
 - Injury time: last chance to change results for teams
- Social Pressure Hypothesis: Do referees provide more injury time when it benefits more the home team?
 - Yielding to social pressure of public
 - No social learning plausible
 - Note: referees professionals, are paid to be independent

Results I

- Figure 1 – Clear pattern, very large effects

FIGURE 1.—INJURY TIME AWARDED BY SCORE MARGIN



Number of minutes awarded by referees as a function of the margin in favor of the home team at the end of the match. Score margin = (goals scored by home team) – (goals scored by visiting team). Note: 3.3% of the matches ended with score differences smaller than -2; 5.2%, with score differences greater than 3.

Results II

- Table 5. Response to incentives → After 1994, 3 points for winning (1 for drawing, 0 for losing).

TABLE 5.—MARGINAL EFFECT OF INCENTIVES ON INJURY TIME

Statistic	[1]	[2]
<i>Constant</i>	3.50** (0.14)	3.11** (0.32)
<i>Score Difference</i>	-1.53** (0.18)	-1.56** (0.18)
<i>Year Effect</i>	0.81** (0.18)	0.7** (0.21)
<i>Year × Score Difference</i>	-0.58* (0.23)	-0.52* (0.23)
<i>Yellow Cards</i>		0.07** (0.02)

Results III

- Table 6. Response to social pressure: size of audience

TABLE 6.—EFFECT OF THE SIZE AND COMPOSITION OF THE CROWD ON REFEREE BI

Statistic	[1]	[2]
<i>Constant</i>	3.23** (0.18)	2.94** (0.20)
<i>Score Difference</i>	−0.93** (0.20)	−0.96** (0.21)
<i>Year Effect</i>	0.36** (0.11)	0.33** (0.11)
<i>Attendance</i>	0.00 (0.00)	0.00 (0.00)
<i>Attendance × Score Difference</i>	−0.02** (0.00)	−0.02** (0.00)
<i>Yellow Cards</i>		0.07** (0.02)
<i>Budget Home</i>		

Social Pressure in the Workplace

- **Mas-Moretti (AER 2009).** Evidence of response to social pressure in the workplace
 - Workplace setting → Large retail chain
 - Very accurate measure of productivity, scanning rate
 - Examine what happens to productivity (speed of scanning) in response to entry of faster/slower coworkers
 - Schedule determined 2 weeks in advance
 - Social Pressure: Are others observing the employer?
- Slides courtesy of Enrico

Data

- We observe all the transactions that take place for 2 years in 6 stores. For each transaction, we observe the number of items scanned, and the length of the transaction in seconds.
- We define individual productivity as the number of items scanned per second.
- We know who is working at any moment in time, where, and whom they are facing
- Unlike much of the previous literature, our measure of productivity is precise, worker-specific and varies with high-frequency.

Institutional features

- Workers in our sample perform the same task use the same technology, and are subject to the same incentives
- Workers are unionized
- Compensation is a fixed hourly payment
- Firm gives substantial scheduling flexibility to the workers

What is the relationship between individual effort and co-worker permanent productivity?

- First we measure the *permanent* component of productivity of each worker

$$y_{itcs} = \theta_i + \sum_{j \neq i} \pi_j W_{jtcs} + \psi X_{itcs} + \gamma_{dhs} + \lambda_{cs} + e_{itcs}.$$

For each worker i , 10 minute period and store, we average the permanent productivity of all the co-workers (excluding i) who are active in that period: $\Delta \bar{\theta}_{-ist}$

- Second, we regress ten minutes *changes* in individual productivity on *changes* in average permanent productivity of co-workers

Finding 1: There is a positive association between changes in co-worker permanent productivity and changes in individual effort

	(1)	(2)
Δ Co-worker permanent Productivity	0.176 (0.023)	0.159 (0.023)
Controls	No	Yes

$$\Delta y_{itcs} = \beta \Delta \bar{\theta}_{-ist} + \gamma_{tds} + \psi \Delta X_{tcs} + e_{itcs}$$

i = individual

t = 10 minute time interval

c = calendar date

s = store

Finding 2: The magnitude of the spillover effect varies dramatically depending on the skill level

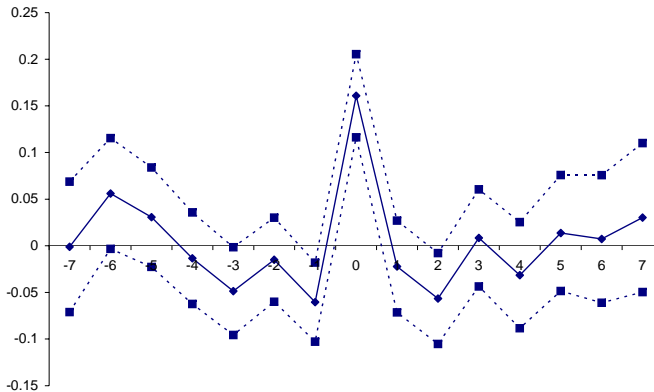
	(2)	(3)
Δ Co-worker permanent productivity	0.159 (0.023)	0.261 (0.033)
Δ Co-worker permanent prod. \times Above average worker		-0.214 (0.046)
Observations	1,734,140	1,734,140
Controls	Yes	Yes

$$\Delta y_{itcs} = \beta \Delta \bar{\theta}_{-ist} + \gamma_{tds} + \psi \Delta X_{tcs} + e_{itcs}$$

What Determines Variation in Co-Workers Quality?

- Shifts are pre-determined
- Management has no role in selecting specific workers for shifts
- We measure co-workers productivity using permanent productivity (not current)
- Our models are in first differences: We use variation within a day and within a worker

The lags and leads for the effect of changes of average co-worker productivity on reference worker productivity



$$\begin{aligned} \Delta y_{itcs} = & \beta_{-7} \Delta \bar{\theta}_{-i(t-7)cs} + \beta_{-6} \Delta \bar{\theta}_{-i(t-6)cs} + \beta_{-5} \Delta \bar{\theta}_{-i(t-5)cs} + \beta_{-4} \Delta \bar{\theta}_{-i(t-4)cs} + \beta_{-3} \Delta \bar{\theta}_{-i(t-3)cs} + \beta_{-2} \Delta \bar{\theta}_{-i(t-2)cs} \\ & + \beta_{-1} \Delta \bar{\theta}_{-i(t-1)cs} + \beta_0 \Delta \bar{\theta}_{-i(t)cs} + \beta_1 \Delta \bar{\theta}_{-i(t+1)cs} + \beta_2 \Delta \bar{\theta}_{-i(t+2)cs} + \beta_3 \Delta \bar{\theta}_{-i(t+3)cs} + \beta_4 \Delta \bar{\theta}_{-i(t+4)cs} + \beta_5 \Delta \bar{\theta}_{-i(t+5)cs} \\ & + \beta_6 \Delta \bar{\theta}_{-i(t+6)cs} + \beta_7 \Delta \bar{\theta}_{-i(t+7)cs} + \zeta \mathbf{M} + e_{itcs}, \end{aligned}$$

What explains spillovers?

- There are at least two possible explanations (Kendal and Lazear, 1992)
 - Guilt / Contagious enthusiasm
 - Social pressure ("I care what my co-workers think about me")
- We use the spatial distribution of register to help distinguish between mechanisms
 - Guilt / Contagious enthusiasm implies that the spillover generate by the entry of a new worker should be larger for those workers who can observe the entering worker
 - Social pressure implies that the spillover generate by the entry of a new worker should be larger for those workers who who are observed by the new worker

Finding 3

- Moreover, the addition of a worker behind an incumbent worker, regardless of her productivity, results in increased productivity of the incumbent worker.
- The addition of a worker in front, on the other hand, *decreases* productivity of the incumbent worker.
- This finding suggests that there is still scope for free-riding, but only when the free-riding is difficult to observe by other workers.

Table 5: Models by spatial orientation and proximity

	(1)	(3)
Δ Co-worker permanent productivity behind	0.233 (0.019)	
Δ Co-worker permanent productivity in front	0.007 (0.018)	
Δ Co-worker permanent productivity behind & closer		0.162 (0.016)
Δ Co-worker permanent productivity in front & closer		0.016 (0.015)
Δ Co-worker permanent productivity behind & farther		0.100 (0.018)
Δ Co-worker permanent productivity in front & farther		0.003 (0.018)

Voter Turnout

- Final Example: Effect of Social Pressure on Voting
 - Large literature of field experiments to impact voter turnout
 - Typical design: Day before (local) election reach treatment household and encourage them to vote
 - Some classical examples

Paper	Treatment (1)	Election type or question (2)	Variable t (3)	Year (4)	Place (5)	Sample size (6)	Control group t_T (7)	Treatment group t_C (8)	Exposure rate $e_T - e_C$ (9)	Persuasion rate (10)
Field Experiments										
Gerber and Green [2000]	Door-to-door canvassing	Federal elect.	Turnout	1998	New Haven	$N = 14,473$	0.422	0.463	0.270	0.263
	Canvassing + mail + calls	Federal elect.	Turnout	1998	New Haven	$N = 14,850$	0.422	0.448	0.270	0.167
Green, Gerber, and Nickerson [2003]	Door-to-door canvassing	Local elect.	Turnout	2001	6 cities	$N = 18,933$	0.286	0.310	0.293	0.118
Green and Gerber [2001]	Phone calls by youth vote	General elect.	Turnout	2000	4 cities	$N = 4,377$	0.660	0.711	0.737	0.205
	Phone calls 18– 30-year-olds	General elect.	Turnout	2000	2 cities	$N = 4,377$	0.405	0.416	0.414	0.045

Example

- In these experiments, typically mailings are the cheapest, but also the least effective get-out-the-vote treatment
- **Gerber, Green, and Larimer (APSR, 2008):** Add social pressure to these treatments
- Setting:
 - August 2006, Michigan
 - Primary election for statewide offices
 - Voter turnout 17.7% registered voters
- Experimental sample: 180,000 households on Voter File
- Mailing sent 11 days prior to election

Experimental Design

- Control households get no mail ($N=100,000$)
- *Civic Duty Treatment*. 'DO YOUR CIVIC DUTY—VOTE!'

Civic Duty mailing

3 0 4 2 6 - 2 ||| || || || XXX

For more information: (517) 351-1975

email: ctov@greber.com

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Dear Registered Voter:

DO YOUR CIVIC DUTY AND VOTE!

Why do so many people fail to vote? We've been talking about this problem for years, but it only seems to get worse.

The whole point of democracy is that citizens are active participants in government; that we have a voice in government. Your voice starts with your vote. On August 8, remember your rights and responsibilities as a citizen. Remember to vote.

DO YOUR CIVIC DUTY — VOTE!

Experimental Design

- *Hawthorne Treatment*. Information that voters' turnout records are being studied

Dear Registered Voter:

YOU ARE BEING STUDIED!

Why do so many people fail to vote? We've been talking about this problem for years, but it only seems to get worse.

This year, we're trying to figure out why people do or do not vote. We'll be studying voter turnout in the August 8 primary election.

Our analysis will be based on public records, so you will not be contacted again or disturbed in any way. Anything we learn about your voting or not voting will remain confidential and will not be disclosed to anyone else.

DO YOUR CIVIC DUTY — VOTE!

Experimental Design

- *Self-Information Treatment.* Give information on own voting record

Dear Registered Voter:

WHO VOTES IS PUBLIC INFORMATION!

Why do so many people fail to vote? We've been talking about the problem for years, but it only seems to get worse.

This year, we're taking a different approach. We are reminding people that who votes is a matter of public record.

The chart shows your name from the list of registered voters, showing past votes, as well as an empty box which we will fill in to show whether you vote in the August 8 primary election. We intend to mail you an updated chart when we have that information.

We will leave the box blank if you do not vote.

DO YOUR CIVIC DUTY—VOTE!

OAK ST	Aug 04	Nov 04	Aug 06
9999 ROBERT WAYNE		Voted	_____
9999 LAURA WAYNE	Voted	Voted	_____

Experimental Design

- *Other-Information Treatment.* Know if neighbors voted!

Dear Registered Voter:

WHAT IF YOUR NEIGHBORS KNEW WHETHER YOU VOTED?

Why do so many people fail to vote? We've been talking about the problem for years, but it only seems to get worse. This year, we're taking a new approach. We're sending this mailing to you and your neighbors to publicize who does and does not vote.

The chart shows the names of some of your neighbors, showing which have voted in the past. After the August 8 election, we intend to mail an updated chart. You and your neighbors will all know who voted and who did not.

DO YOUR CIVIC DUTY — VOTE!

	Aug 04	Nov 04	Aug 06
MAPLE DR			
9995 JOSEPH JAMES SMITH	Voted	Voted	_____
9995 JENNIFER KAY SMITH		Voted	_____
9997 RICHARD B JACKSON		Voted	_____

Results

- Substantial impacts especially when neighbors get to see
- All the results are highly statistically significant
- Results huge given that 1/3 of recipients probably never opened the mailer
- Impact: Obama campaign considered using this, but decided too risky

TABLE 2. Effects of Four Mail Treatments on Voter Turnout in the August 2006 Primary Election

	Experimental Group				
	Control	Civic Duty	Hawthorne	Self	Neighbors
Percentage Voting	29.7%	31.5%	32.2%	34.5%	37.8%
N of Individuals	191,243	38,218	38,204	38,218	38,201

Section 6

Social Pressure: Charitable Giving

DellaVigna, List, and Malmendier (2012)

- Test of prediction of social pressure model: Avoidance of fund-raiser

This Paper

- Model of giving with altruism and social pressure
 - Consumer may receive advance notice of fundraiser
 - Consumer can avoid (or seek) fundraiser at a cost
 - Consumer decides whether to give (if at home)
- Field experiment: door-to-door fundraiser
 - Control group: standard fundraiser
 - Flyer Treatment: flyer on doorknob on day before provides advance notice about hour of visit
 - Opt-Out Flyer Treatment: flyer with box “do not disturb”

Flyer Layout with and without Opt-Out

 <p>LA RABIDA CHILDREN'S HOSPITAL</p> <p>Fundraising Campaign for La Rabida Children's Hospital</p> <p>Fundraisers will visit this address tomorrow (/) between and to raise funds for La Rabida Children's Hospital.</p> <p><input type="checkbox"/> Check this box if you Do not want to be disturbed.</p>	 <p>LA RABIDA CHILDREN'S HOSPITAL</p> <p>Fundraising Campaign for La Rabida Children's Hospital</p> <p>Fundraisers will visit this address tomorrow (/) between and to raise funds for La Rabida Children's Hospital.</p>
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This Paper

- Model of giving with altruism and social pressure
 - Consumer may receive advance notice of fundraiser
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- Field experiment: door-to-door fundraiser
 - Control group: standard fundraiser
 - Flyer Treatment: flyer on doorknob on day before provides advance notice about hour of visit
 - Opt-Out Flyer Treatment: flyer with box “do not disturb”
 - Survey Treatments: Administer surveys with varying payment and duration and with or without flyers → to structurally estimate parameters.

Survey Flyers

THE UNIVERSITY OF
CHICAGO



University of Chicago Study

Researchers will
visit this address
tomorrow (/)
between and
to conduct a
10 minute survey.

THE UNIVERSITY OF
CHICAGO



University of Chicago Study

Researchers will
visit this address
tomorrow (/)
between and
to conduct a
10 minute survey.

You will be paid \$10
for your participation.

- **Model**

- Giving game with giver and fund-raiser. Timing:

- *Stage 1:*

- * No Flyer: Giver at home with probability $h = h_0$

- * Flyer:

- Giver sees flyer with probability r

- Can alter probability of being at home h from baseline h_0 at cost $c(h)$, with $c(h_0) = 0$, $c'(h_0) = 0$, and $c''(\cdot) > 0$

- *Stage 2:*

- * Fund-raiser visits home of giver:

- If giver at home (w/ prob. h), in-person donation $g^* \geq 0$

- If saw flyer (w/ prob. r), donation via mail $g_m^* \geq 0$

- Utility function of giver:

$$U(g) = u(W - g - g_m) + av(g + \theta g_m, G_{-i}) - s(g)$$

- Agent cares about:

- Private consumption $u(W - g - g_m)$, with $u'(\cdot) > 0$ and $u''(\cdot) \leq 0$
- Giving to charity $av(\cdot, G_{-i})$, with $v'_g(\cdot, \cdot) > 0$, $v''_{g,g}(\cdot, \cdot) < 0$, $\lim_{g \rightarrow \infty} v'_g(g, \cdot) = 0$, and $v(0, G_{-i}) = 0$.

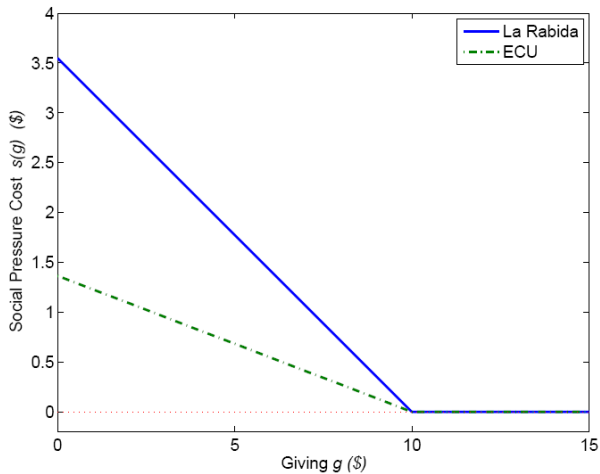
- Two special cases for $v(g, G_{-i})$:

- *Pure altruism* (Charness and Rabin 2002, Fehr and Gächter, 2000):
 $v(g, G_{-i}) = v(g + \theta g_m + G_{-i})$, a is altruism parameter
- *Warm glow* (Andreoni, 1989 and 1990):
 $v(g, G_{-i}) = v(g)$, a is weight on warm glow

- Giving via mail is less attractive ($\theta < 1$): less warm glow, cost of giving,...

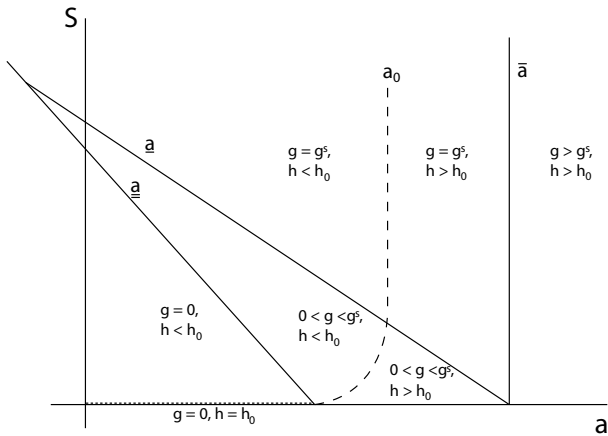
- Social Pressure $s(g) = S(g^s - g) \cdot \mathbf{1}_{g < g^s} \geq 0$
 - Social pressure $s = 0$ if not at home or if giving $g \geq g^s$ (socially acceptable amount)
 - Social pressure $s > 0$ for giving $g < g^s$, decreasing in g
- Captures identity (Akerlof and Kranton, 2000), social norms, or self-signalling (Bodner and Prelec, 2002; Grossman, 2007)
- Psychology evidence:
 - Tendency to conformity and obedience (Milgram, 1952 and Asch, 1957)
 - Effect stronger for face-to-face interaction

Figure. Social Pressure Cost At Estimated Parameters



- **Second-stage Maximization (Giving)**

- **Lemma 1a. (Conditional Giving In Person).** *There is a unique optimal donation $g^*(a, S)$ (conditional on being at home), which is weakly increasing in a and takes the form: (i) $g^*(a, S) = 0$ for $a \leq \underline{a}$; (ii) $0 < g^*(a, S) < g^s$ for $\underline{a} < a < \bar{a}$; (iii) $g^*(a, S) = g^s$ for $\bar{a} \leq a \leq \bar{a}$; (iv) $g^*(a, S) > g^s$ for $a > \bar{a}$.*
- No giving via mail when at home
- **Lemma 1b (Conditional Giving Via Mail).** *There is a unique optimal donation via mail $g_m^*(a)$ (conditional on not being at home), which is weakly increasing in a and takes the form: (i) $g_m^*(a) = 0$ for $a < a_m$; (ii) $g_m^*(a) > 0$ for $a \geq a_m$; (iii) for all levels of a , $g_m^*(a) \leq g^*(a; S)$.*



- **First-Stage Maximization (Presence at Home)**

- Probability of being at home h :

- **Control (NF) Treatment** ($r = 0$): Exogenous, $h = h_0$
- **Flyer (F) Treatment** ($r > 0$): Choose $h \in [0, 1]$ at cost $c(h)$

- **Lemma 2 (Presence at Home).** *There is a unique optimal probability of being at home $h^*(a, S)$*

- For $S = 0$ (no social pressure), $h^*(a, 0) = h_0$ for $a \leq \underline{a}$ and $h^*(a, 0) > h_0$.
- For $S > 0$ (social pressure), $h^*(a, S) < h_0$ for $a \leq \underline{a}$; there is unique $a_0(S) \in (\underline{a}, \bar{a})$ such that $h^*(a_0(S)) = h_0$.

- Giving due to altruism $\rightarrow h > h_0$ (Seek being at home)
- Giving due to social pressure $\rightarrow h < h_0$ (Avoid being at home)

- **Opt-Out (O) Treatment**

- Flyer + Consumers can tell the charity not to disturb
- Cost of probability of home:

$$C(h) = \begin{cases} 0 & \text{if } h = 0 \\ c(h) & \text{if } h > 0 \end{cases}$$

- Still costly to remain at home, but no cost to keep charity out
- (Notice: Never want to set $0 < h < h_0$)

- **Lemma 3 (Opt-Out Decision).** *For $S = 0$ (no social pressure), the agent never opts out for any a . For $S > 0$ (social pressure), the agent opts out for sufficiently low altruism, $a < a_0(S)$.*

- Allow for heterogeneity in altruism a , with $a \sim F$
- Two special cases:
 - *Altruism and No Social Pressure* (A-NoS, $S = 0$ and $F(\underline{a}) < 1$)
 - *Social Pressure and Limited Altruism* (S-NoA, $S > 0$ and $F(\underline{a}) = 1$)
- **Proposition 1.** *The probability $P(H)$ of home presence is*
 - A-NoS: $P(H)_F = P(H)_{OO} > P(H)_{NF}$
 - S-NoA: $P(H)_{NF} > P(H)_F > P(H)_{OO}$
- **Proposition 2.** *The unconditional probability $P(G)$ of giving is*
 - A-NoS: $P(G)_F = P(G)_{OO} > P(G)_{NF}$
 - S-NoA: $P(G)_{NF} > P(G)_F > P(G)_{OO}$

Fundraising Treatments

```
graph TD; A[Fundraising Treatments] --> B[Fundraise No Flyer La Rabida]; A --> C[Fundraise No Flyer ECU]; B --> D[Fundraise Flyer La Rabida]; C --> E[Fundraise Flyer ECU]; D --> F[Fundraise Flyer & Opt-Out La Rabida]; E --> G[Fundraise Flyer & Opt-Out ECU];
```

Fundraise
No Flyer
La Rabida

Fundraise
Flyer
La Rabida

Fundraise
Flyer & Opt-Out
La Rabida

Fundraise
No Flyer
ECU

Fundraise
Flyer
ECU

Fundraise
Flyer & Opt-Out
ECU

Experimental Design

- Recruitment and Training: 48 solicitors and surveyors
 - undergraduate students at the University of Chicago, UIC, and Chicago State University
 - Interviewed, trained at UoC
 - aware of different charities but not of treatment
- Time and Place:
 - Saturdays and Sundays between April, 2008 and October, 2008
 - Hours between 10am and 5pm
 - Towns around Chicago: Burr Ridge, Flossmoor, Kenilworth, Lemont, Libertyville, Oak Brook, Orland Park, Rolling Meadows, and Roselle
- Randomization
 - within a solicitor-day observations (4h/6h shifts per day) and
 - at the street level within a town
- Different treatments in different periods ➔ randomization is conditional on solicitor and day fixed effects

Figure 4a. Frequency of Answering the Door

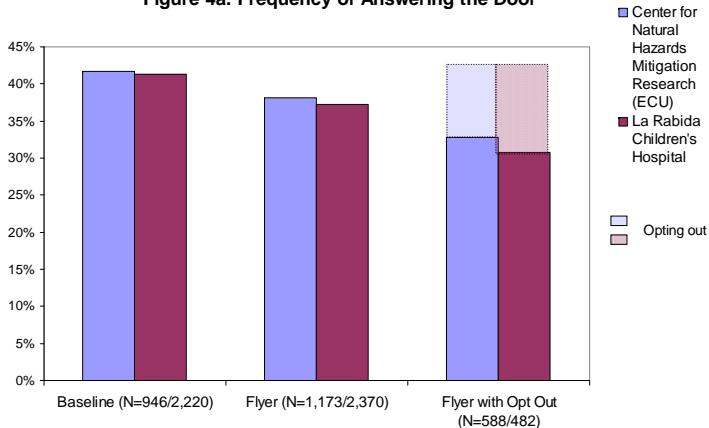


Figure 4b. Frequency of (Unconditional) Giving

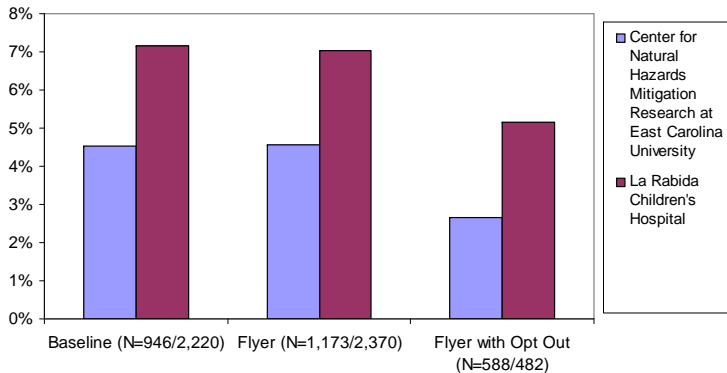


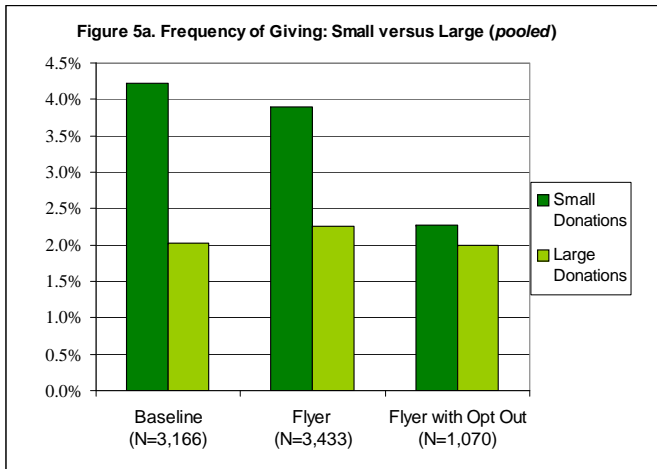
Table 2. Results for Fund-Raising Treatments

Specification:	OLS Regressions			
Dep. Var.:	Indicator for Answering the Door		Indicator for Giving	
	(1)	(2)	(3)	(4)
Flyer Treatment	-0.0388 (0.0137)***		-0.0009 (0.0062)	
Flyer with opt out Treatment	-0.0966 (0.0193)***		-0.0197 (0.0083)**	
Flyer Treatment * ECU Charity		-0.0365 (0.0313)		0.0006 (0.0094)
Flyer with opt out * ECU Charity		-0.089 (0.0271)***		-0.0183 (0.0100)*
Flyer Treatment * La Rabida Charity		-0.0396 (0.0144)***		-0.0019 (0.0078)
Flyer with opt out * La Rabida Charity		-0.106 (0.0319)***		-0.0202 (0.0132)
Indicator ECU Charity		0.0041 (0.0234)		-0.0263 (0.0085)***
Omitted Treatment	No-Flyer	No-Flyer, La Rabida	No-Flyer	No-Flyer, La Rabida
Mean of Dep. Var. for Omitted Treatment	0.4151	0.413	0.0629	0.0717
Fixed Effects for Solicitor, Date- Location, Hour, and Area Rating	X	X	X	X
N	N = 7668	N = 7668	N = 7668	N = 7668

- Evidence by Donation Size:**

Social pressure more likely to yield small donations

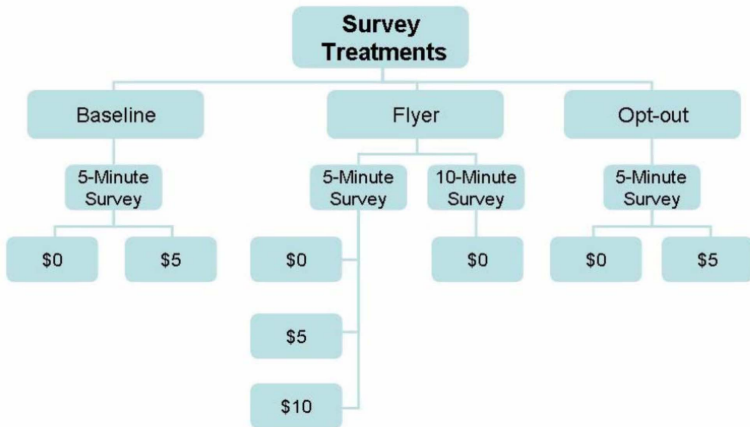
Use median donation size (\$10) as cut-off point

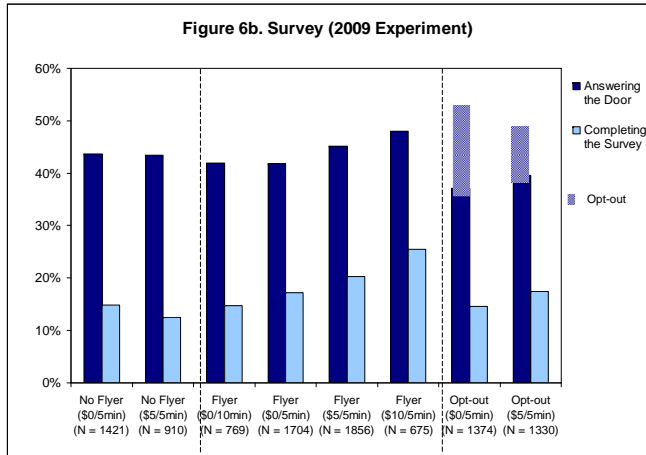


Survey Treatments

- Results of fundraiser do not easily allow the estimation of altruism and social pressure parameters
 - Unobserved cost of adjustment $c(h)$
- Solution: estimate elasticity with respect to monetary incentives
- Survey treatments with varying compensation and duration
- Treatments run in 2008 and 2009

Figure 2b. Summary of Door-to-Door Experimental Treatments Run in 2009





•Survey Results (2009, N = 10,032)

Higher payment (lower duration)

increases proportion at home monotonically

increases survey completion monotonically (except in NF)

- **Structural estimates (Minimum-distance estimator)**

- Minimize distance between predicted moments $m(\vartheta)$ and observed ones \hat{m} :

$$\min_{\vartheta} (m(\vartheta) - \hat{m})' W (m(\vartheta) - \hat{m})$$

- Moments $m(\vartheta)$:

1. Probability of opening the door ($P(H)_j^c$, $j = F, NF, OO$, $c = LaR, Ecu$)
2. Probability of checking opt-out box ($P(OO)_{OO}^c$, $c = LaR, Ecu$)
3. Probability of giving at all, and giving an amount range ($P(G)_j^c$, $j = F, NF, OO$, $c = LaR, Ecu$)
4. Probability of opening door in survey ($P(H)_j^S$)
5. Probability of filling survey ($P(S)_j^S$)

- Weighting matrix W diagonal of inverse of variance-covariance matrix

- Parametric assumption to estimate the model:
 1. Consumption utility linear: $u(W - g) = W - g$
 2. Altruism function $av(g, G_{-i}) = a \log(G + g)$
 3. Altruism a is distributed $N(\mu, \sigma)$
 4. Acceptable donation $g^S = \$10$ (median)
 5. Cost function $c(h) = (h - h_0)^2 / 2\eta$
 6. No mail giving ($\theta = 0$)

- Marginal utility of giving: $a / (G + g) - 1$

● Parameters ϑ :

1. h_0^{2008} and h_0^{2009} —probability of being at home in no-flyer conditions
2. r —probability of observing and remembering the flyer
3. η —responsiveness of the probability of being at home to the utility of being at home
4. μ_a^c ($c = LaR, Ecu$)—mean of the distribution F of the altruism α
5. σ_α^c ($c = LaR, Ecu$)—standard deviation of $F(\alpha)$
6. G —curvature of altruism/warm glow function
7. S^c ($c = LaR, Ecu$)—social pressure associated with not giving
8. μ^S —mean of the distribution F^S from which the utility of the survey is drawn
9. σ^S —standard deviation of F^S
10. S^S —social pressure associated with saying no
11. v^S —value of an hour of time completing a survey

- Identification:
 - Prob. being at home h_0 \leftarrow Control group
 - Prob. seeing flyer r \leftarrow Share opting out
 - Utility of doing survey μ^S and σ^S \leftarrow Share completing survey
 - Value of time v^S \leftarrow Comparison of effect of \$10 payment and 5 minute duration
 - Elasticity of home presence η \leftarrow Share opening door in survey for different payments + Giving in charity
 - Altruism parameters μ^c, σ^c, G \leftarrow Given η , share giving different amounts
 - Social pressure parameters S^i and S^S \leftarrow Share opening door and giving

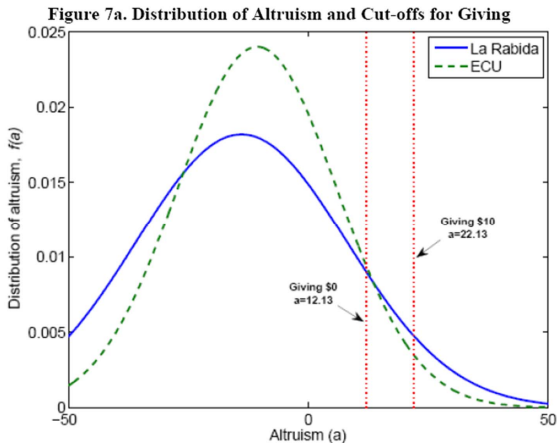
Appendix Table 1. Empirical Moments and Estimated Moments

Specification:		Minimum-Distance Estimates			
Charity		La Rabida Charity		ECU Charity	
		Empirical	Estimated	Empirical	Estimated
Moments for Charity		Moments	Moments	Moments	Moments
<u>Moments</u>		(1)	(2)	(3)	(4)
P(Home) No Flyer		0.4130	0.4142	0.4171	0.4142
P(Home) Flyer		0.3733	0.3735	0.3806	0.3983
P(Home) Opt-Out		0.3070	0.2989	0.3281	0.2911
P(Opt Out) Opt-Out		0.1202	0.1142	0.0988	0.1179
P(Giving) No Flyer		0.0717	0.0666	0.0455	0.0422
P(Giving) Flyer		0.0699	0.0710	0.0461	0.0449
P(Giving) Opt-Out		0.0515	0.0633	0.0272	0.0390
<u>Additional Moments (not shown)</u>					
P($0 < \text{Giving} < 10$), P(Giving=10),					
P($10 < \text{Giving} \leq 20$), P($20 < \text{Giving} \leq 50$),					
P(Giving>50) in Treatments NF, F, OO		X	X	X	X
N		N = 4962	N = 4962	N = 2707	N = 2707

Table 4. Minimum-Distance Estimates: Benchmark Results

	Estimates with Identity			
	Benchmark Estimates		Weighting Matrix	
<i>Common Parameters</i>	(1)		(2)	
Prob. Answering Door (h) - Year 2008	0.414 (0.004)		0.414 (0.006)	
Prob. Answering Door (h) - Year 2009	0.449 (0.007)		0.445 (0.008)	
Prob. Observing Flyer (r)	0.322 (0.011)		0.302 (0.012)	
Elasticity of Home Presence (eta)	0.047 (0.014)		0.060 (0.031)	
Implied Cost of Altering Prob. Home by 10 pp.	0.106		0.083	
<i>Survey Parameters</i>				
Mean Utility (in \$) of Doing 10-Minute Survey	-26.865 (4.233)		-26.936 (5.509)	
Std. Dev. of Utility of Doing Survey	30.285 (5.208)		30.332 (6.303)	
Value of Time of One-Hour Survey	74.580 (22.901)		76.761 (26.130)	
Social Pressure Cost of Saying No to Survey	4.784 (1.285)		3.869 (1.918)	
<i>Charity Parameters</i>				
	La Rabida	ECU	La Rabida	ECU
Mean Weight on Altruism Function (mu)	-13.910 (3.250)	-10.637 (4.273)	-13.586 (9.481)	-15.109 (10.919)
Std. Dev. of Weight on Altruism Function	21.935 (1.335)	16.620 (1.832)	19.832 (3.885)	19.832 (3.998)
Curvature of Altruism Function (G)	12.133 (5.147)		12.224 (15.518)	
Social Pressure Cost of Giving 0 in Person	3.550 (0.615)	1.364 (0.744)	3.140 (1.674)	1.906 (1.475)

Implied distribution of altruism

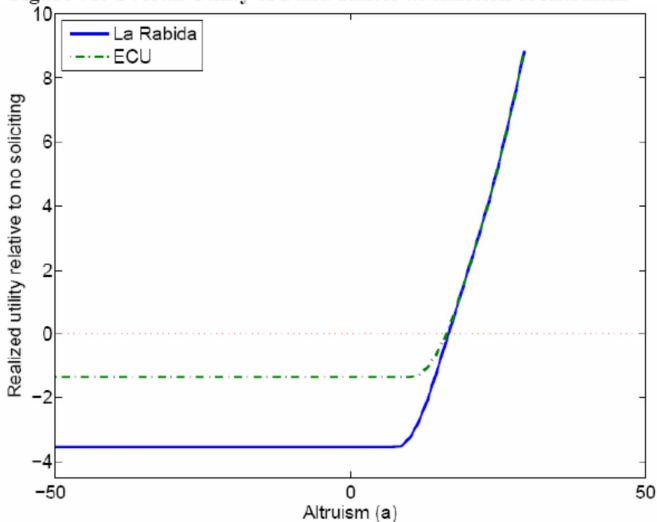


Marginal utility of giving (for $S = 0$) is $a/(G+g)-1$

Hence, give $g > 0$ if $a > G = 12.13$

Welfare: Does a fund-raiser increase utility for the giver?

Figure 7b. Overall Utility of Fund-Raiser as function of Altruism



Welfare

1. Low-altruism households pay social pressure cost
2. High-altruism households get benefit
3. Since the former dominate, on net negative welfare for solicitee

Panel C. Welfare

Welfare in Standard (No-Flyer) Fund-Raiser

	<u>La Rabida Charity</u>	<u>ECU Charity</u>
Welfare per Household Contacted (in \$)	-1.077 (0.160)	-0.439 (0.286)
Money Raised per Household Contacted	0.722 (0.036)	0.332 (0.046)
Money Raised per Household, Net of Salary	0.247 (0.036)	-0.143 (0.046)

- Societal welfare effect can still be positive if money used very well
But amount of money raised small (negative for ECU)

Flyer and opt-out treatment increase solicitee welfare
 Can also raise charity welfare (i.e., net fund-raising)

<u>Panel C. Welfare</u>	<u>La Rabida Charity</u>	<u>ECU Charity</u>
<i>Welfare in Standard (No-Flyer) Fund-Raiser</i>		
Welfare per Household Contacted (in \$)	-1.077 (0.160)	-0.439 (0.286)
Money Raised per Household Contacted	0.722 (0.036)	0.332 (0.046)
Money Raised per Household, Net of Salary	0.247 (0.036)	-0.143 (0.046)
<i>Welfare in Fund-Raiser with Flier</i>		
Welfare per Household Contacted (in \$)	-0.924 (0.145)	-0.404 (0.273)
Money Raised per Household Contacted	0.859 (0.044)	0.333 (0.046)
Money Raised per Household, Net of Salary	0.248 (0.044)	-0.278 (0.046)
<i>Welfare in Fund-Raiser with Opt-out</i>		
Welfare per Household Contacted (in \$)	-0.586 (0.085)	-0.248 (0.196)
Money Raised per Household Contacted	0.810 (0.045)	0.369 (0.055)
Money Raised per Household, Net of Salary	0.294 (0.036)	-0.147 (0.046)

Section 7

Social Signaling

Social Signaling

- **(Bodner and Prelec, 2002, Benabou and Tirole, 2004, 2006)**
 - Ego utility from thinking of self as generous
 - Individuals are unsure of (forget) their type
 - Infer type from own behavior in Bayesian way
 - Take into account signaling game in their actions
 - (Signaling can be to self or others)

- Idea:
 - Individuals may behave pro-socially to signal to self (or others) that they are generous type
 - Generates prediction of pro-social behavior (like other models)
 - Unique prediction: behave less pro-socially if pro-social behavior is less diagnostic of generosity
 - Crowd-out of Intrinsic motivation (Deci 1971)
- Nice features:
 - Micro-founded: Bayesian updating, signaling
 - Ego utility very plausible
- Problems:
 - Hard to solve
 - Multiple equilibria possible
 - Hard to separate self-signaling from signaling to others

Example

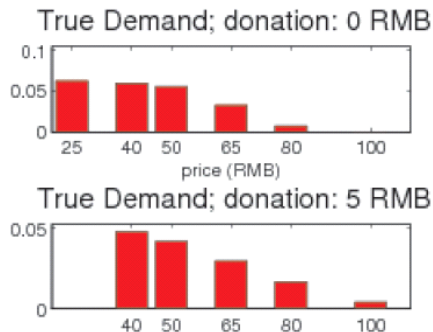
- Consider this in the context of **Dube, Luo, and Fang (2015)** paper on case-based marketing
 - Send 30,000 SMS messages in China offering to buy movie ticket for 3-D version of *X-Men: Days of Future Past*
 - Standard price: 100 RMB
 - Randomize price discount: 0, 20, 35, 50, 60, 75 RMB
 - Cross-randomize charitable giving bundled with movie ticket purchase: "If you purchase ticket, X RMB will go to charity": 0, 5, 10, 15 RMB
 - Follow-up survey on motivation

Sample sizes

Variable	Donation (RMB)				
discount (RMB)		0	5	10	15
	0	700	700	700	700
	20	700	1,000	1,000	1,000
	35	700	1,000	3,000	3,000
	50	700	1,000	3,000	3,000
	60	700	1,000	3,000	3,000
	75	700	-	-	-

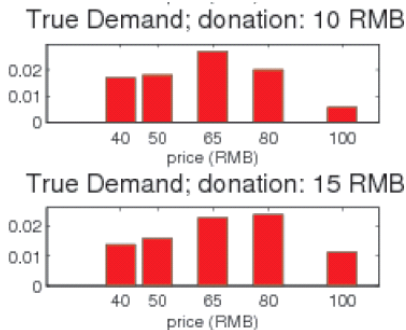
Results: Low Donation

- For low donation, monotonic effect of discount



Results: High Donation

- For high donation, non-monotonic effect of discount → Crowd-out of motivation



Striking result: Interpretation?

- Model adapted from Benabou-Tirole
- Part 1: Individual has consumption utility

$$V + \alpha p + \gamma a$$

- V is utility from movie,
- p is price of movie, α (<0) is price elasticity
- a is donation, γ is (reduced-form) altruism
- So far, standard model with altruism

Striking result: Interpretation?

- Part 2a: Ego utility on altruism:

$$\lambda_{\gamma} E(\gamma | a, p, y)$$

- Individual derives utility from thinking of being altruistic (high a)
- Weight on ego utility is λ_{γ} : for $\lambda_{\gamma} = 0$, back to pure altruism case
- Individual solves a signaling game to infer γ given price p , discount a , and donation decision $y \in 0, 1$
- Thus, donation ($y = 1$) has ego utility benefits, raising $E\gamma$

Striking result: Interpretation?

- This is not enough: need Part 2b in Ego utility:

$$\lambda_{\alpha} E(a|a, p, y)$$

- Individual derives utility from thinking of self as stingy – or not
- Why this term? There needs to be a signal extraction problem: giving can signal high generosity or low price elasticity
- Unattractive part of Benabou and Tirole model

- Decision: Give ($y = 1$) if

$$\begin{aligned} U(1) &= V + \alpha p + \gamma a + \lambda_{\alpha} E(\alpha | a, p, 1) + \lambda_{\gamma} E(\gamma | a, p, 1) \geq \\ U(0) &= \lambda_{\alpha} E(\alpha | a, p, 0) + \lambda_{\gamma} E(\gamma | a, p, 0) \end{aligned}$$

or

$$V + \alpha p + \gamma a + \Delta(a, p) > 0$$

where Δ is net ego utility

- Updating on γ if purchase ($y = 1$):

$$E\left(\gamma | \gamma > -\frac{V + \alpha p + \Delta(a, p)}{a}\right)$$

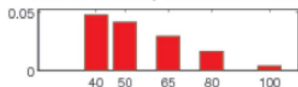
- Specify priors on parameters to derive separating equilibrium of signaling game

True Demand vs. Model

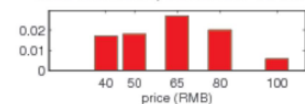
True Demand; donation: 0 RMB



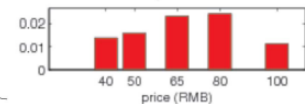
True Demand; donation: 5 RMB



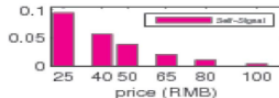
True Demand; donation: 10 RMB



True Demand; donation: 15 RMB



donation: 0 RMB



donation: 5 RMB



donation: 10 RMB



donation: 15 RMB



Parameter Values

- Remarkably good fit, but value of some parameters odd
- Relatedly: How much do you need ego utility on price elasticity: not obvious to interpret

$$\lambda_{\gamma} E(\gamma | a, p, y^h) + \lambda_{\alpha} E(\alpha | a, p, y^h)$$

- Relatedly: Estimation of some parameters appears problematic

- Value V of good negative on average?
(What if allow for not all to pay attention)

- σ_{α} is at boundary

	<i>coefficient</i>	<i>st. error</i>
<i>Donation ($\bar{\gamma}$)</i>	-0.1411	0.1345
<i>Price, (α)</i>	-0.0183	0.0077
<i>Intercept, (\bar{V})</i>	-0.8526	0.225
σ_{γ}	0.1327	0.0632
σ_{α}	0.0001	0.307
λ_{γ}	2.1948	0.7931
λ_{α}	-15.9831	3.452

Section 8

Next Lecture

Next Lecture

- Non-Standard Beliefs
 - Overconfidence
 - Law of Small Numbers
 - Projection Bias
- Non-Standard Decision-Making
 - Limited Attention I