Econ 219B
Psychology and Economics: Applications
(Lecture 13)

Stefano DellaVigna

April 21, 2004

Outline

1. Media: Data
2. Media: Media Bias
3. Media: Media Focus
4. Summary of Evidence
5. Imitation and Persuasion
6. Social Preferences
7. Summary of Evidence

1 Media: Data

- Media deliver information:
  - TV
  - Radio
  - Newspapers
  - Internet

- Media data is fairly easily available:
  - Lexis-Nexis: Newspaper (TV) Content
  - Vanderbilt data set: TV news stories
  - Warren News: Cable channels

- Local monopolies in media markets:
  - Towns have 1 (rarely 2) newspapers (Genesove, 2000)
  - Towns have 1 (rarely 2) cable providers
  - Only two national papers (from late 80s): USA Today, NYT
  - Owners can spin news

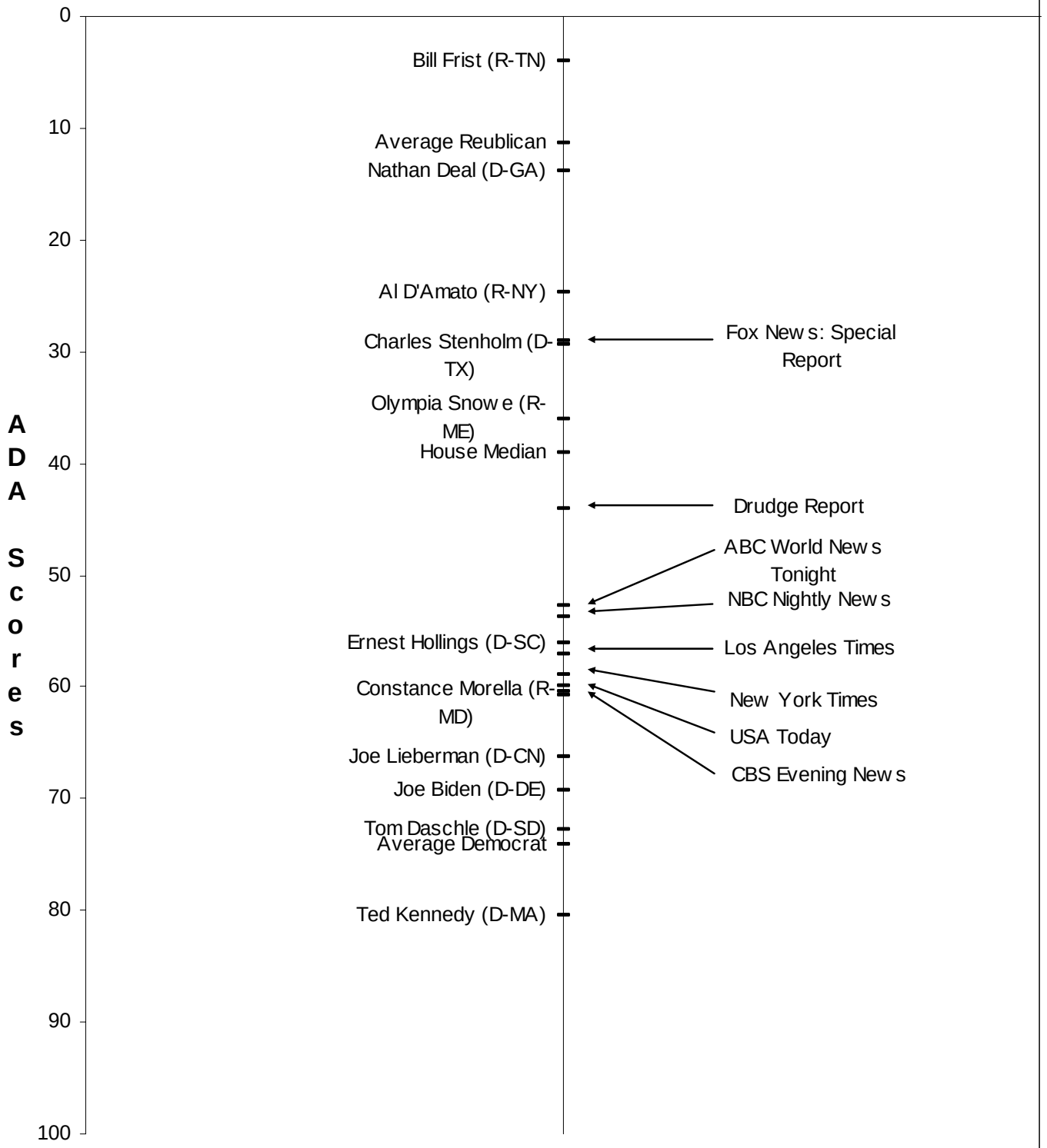
- Media topics:
  - Effect of media on politicians (Besley and Burgess, 2002; Stromberg, 2004) – Skip this
  - Effect of media on focus (George and Waldfogel, 2002; Dyck and Zingales, 2003)
  - Effect of media bias (Groseclose, 2004; Shleifer and Mullainathan, 2004; DellaVigna and Kaplan, 2004)

– Effect of advertisement

2 Media Bias

- Is media content biased?
- Does media bias affect people?
- Objective measure of media bias – Groseclose and Milyo (2004)
- Measure media bias by think-tanks they cite
- Compare to think-tanks cited by politicians
- Deduce imputed ADA score for media

Figure 2. Adjusted ADA Scores of Politicians and Media Outlets, Sentences as Observations



- Does media bias matter?

- Scenario 1:

  1. Sophistication. Invert media bias and recover information

  2. Sorting. Listen to media confirming priors

  – Media bias has no effect on behavior

- Scenario 2:

  1. Persuasion bias (De Marzo et al., 2003)

  2. Consumers understimate bias (Mullainathan and Shleifer, 2005)

  – Media bias has systematic effect on behavior

- Evidence from Fox News (DellaVigna and Kaplan, 2005)

  1. Fast expansion of Fox News in cable markets
     - October 1996: Fox News created
     - June 2000: 17 percent of US population listens regularly to Fox News (Pew)

  2. Geographical differentiation in expansion
     - Cable markets: Local monopolies with capacity constraints
     - Town-level variation in exposure to Fox News
     - 8,634 towns with variation even within a county

3. Conservative content
   - Unique right-wing TV channel (Groseclose and Milyo, 2004)
   - Clear differentiation of content
   - Substantial effect on average information exposure

- Strategy:
  - Compare towns that offer Fox News in 2000 to towns that do not
  - Analyze effect on town-level Republican vote share v between 1996 and 2000

$$v_{t,k} = \frac{Votes_{REPt,k}}{Votes_{REPt,k} + Votes_{DEMt,k}}$$

- Methodology: Differences-in-Differences
- Setup
- Vote shares in Fox News town v_{2000}^{FOX} and v_{1996}^{FOX}
- Vote shares in non-Fox News town v_{2000}^{N} and v_{1996}^{N}
- Causal impact of Fox News on vote share is f
- Assume:

$$\begin{aligned} E\left[v_{2000,k}^{FOX}\right] &= \alpha + f + \eta_{2000} + \phi_{FOX}, \\ E\left[v_{1996,k}^{FOX}\right] &= \alpha + \eta_{1996} + \phi_{FOX}, \\ E\left[v_{2000,k}^{N}\right] &= \alpha + \eta_{2000} + \phi_{N} \\ E\left[v_{1996,k}^{N}\right] &= \alpha + \eta_{1996} + \phi_{N} \end{aligned}$$

- Strategies:

  1. Compare Fox News and non-Fox News towns in 2000

     $$v^{FOX}_{2000,k} - v^{N}_{2000,k} = f + \phi_{FOX} - \phi_N$$

     Biased estimate of the Fox News impact is $\phi_{FOX} - \phi_N \neq 0$, that is, if Fox News towns differ from non-Fox News towns. Quite possible.

  2. Compare Fox News towns in 2000 and 1996:

     $$v^{FOX}_{2000,k} - v^{FOX}_{1996,k} = f + \eta_{2000} - \eta_{1996}$$

     Biased estimate of the Fox News impact is $\eta_{2000} - \eta_{1996} \neq 0$, that is, if Gore $\neq$ Clinton or Bush $\neq$ Dole. Obviously true.

  3. Do double-difference:

     $$\left(v^{FOX}_{2000,k} - v^{FOX}_{1996,k}\right) - \left(v^{N}_{2000,k} - v^{N}_{1996,k}\right) = f$$

     No bias!

- Difference in difference estimate can also be implemented as:

$$v_{2000,k} - v_{1996,k} = \alpha + \phi_k + \beta_F d_{FOX} + \varepsilon_k$$

- The advantage is that one can then also add control variables:

$$v_{2000,k} - v_{1996,k} = \alpha + \phi_k + \beta_F d_{FOX} + \Gamma X_k + \varepsilon_k$$

- Problems with differences-in-differences?...

- Implementation:

  1. Check for differences in the pre-period between Fox News and non-Fox News towns

     - (measure $\phi_{FOX} - \phi_N$)

     - Regress Fox News dummy on control variables (Table 3)

$$d_{k,2000}^{FOX} = \alpha + \beta v_{k,1996}^{R,\text{Pres}} + \Gamma_{2000} X_{k,2000} + \Gamma_{00-90} X_{k,00-90} + \Gamma_C C_{k,2000} + \varepsilon_k.$$

     - Controls:

       * Census controls (Columns 1-6)

       * Cable controls (Column 2-6)

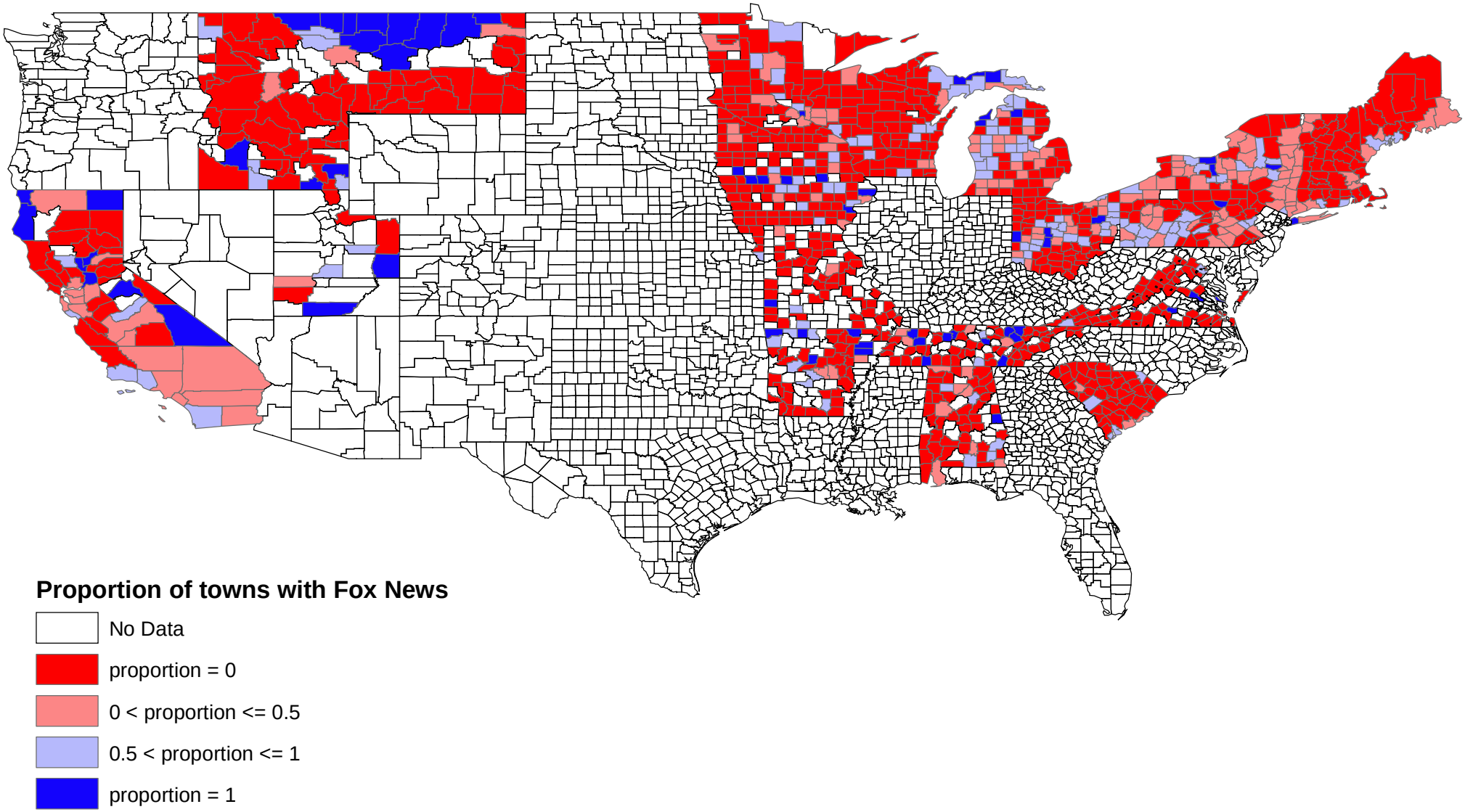
       * US House district dummies (Columns 3-6)

       * County dummies (Column 4)

Table 3. Selective Penetration of Fox News, Linear Probability Model

	Dep. Var.: Fox News Availability in 2000 in Cable System					
	(1)	(2)	(3)	(4)	(5)	(6)
Pres. Republican Vote Share in 1996	0.2237 (0.0380)***	0.0964 (0.0313)***	0.0098 -0.0369	-0.003 -0.0413	0.0104 -0.0399	0.0179 -0.0554
Pres. Turnout in 1996					-0.0203 (0.0319)	
Pres. Rep. Vote Share Change 1988-1992						0.2325 (0.1027)**
Population 2000	0.0023 (0.0010)**	-0.0006 (0.0009)	0.0005 (0.0007)	0.0012 (0.0007)	0.0002 (0.0007)	0.0004 (0.0020)
Some College 2000	0.0717 (0.0784)	0.089 (0.0626)	0.0628 (0.0791)	-0.086 (0.0828)	0.1151 (0.0852)	0.2016 (0.1226)
College Grad. 2000	-0.0555 (0.0514)	-0.1091 (0.0398)***	0.0196 (0.0426)	-0.0434 (0.0408)	-0.0093 (0.0476)	0.1637 (0.0620)***
African American 2000	-0.0665 (0.0425)	-0.0272 (0.0348)	0.0509 (0.0531)	0.0802 (0.0599)	0.0383 (0.0609)	-0.1484 (0.0889)*
Latino 2000	-0.2391 (0.0812)***	-0.1231 (0.0833)	-0.0419 (0.1137)	-0.1795 (0.1294)	-0.0792 (0.1172)	-0.4064 (0.2605)
Unemployment Rate 2000	0.446 (0.2736)	0.5472 (0.2360)**	-0.1031 (0.2350)	-0.3755 (0.2374)	0.0108 (0.2592)	0.3985 (0.3794)
Urban 2000	0.1465 (0.0133)***	0.0107 (0.0119)	-0.0118 (0.0117)	-0.0095 (0.0106)	-0.0081 (0.0127)	0.0355 (0.0195)*
Control for Cable Features		X	X	X	X	X
State and District Fixed Effects			X	X	X	X
County Fixed Effects				X		
R^2	0.0231	0.3439	0.4723	0.6924	0.4709	0.5012
N	*N = 8634*	*N = 8634*	*N = 8634*	*N = 8634*	*N = 7566*	*N = 3065*

Figure 1. Fox News Availability by County, 2000.



Note: Proportion for each county is calculated as the ratio of number of towns with Fox News available via cable to total number of towns in the county. Also, Alaska is not included because it does not have county divisions.

2. Compute difference-in-difference estimator

$$\begin{aligned} v_{k,2000}^{R,\text{Pres}} - v_{k,1996}^{R,\text{Pres}} &= \alpha + \beta_F d_{k,2000}^{FOX} + \\ &\quad \Gamma_{2000} X_{k,2000} + \\ &\quad \Gamma_{00-90} X_{k,00-90} + \\ &\quad \Gamma_C C_{k,2000} + \varepsilon_k. \end{aligned}$$

3. Interpret magnitudes

   - Point estimates of $\hat{\beta}_F$ -.06 percentage points and $+$.15 percentage points
   - Confidence intervals: (-.0036, .0024) and (-.0019,.0049)
   - Can reject effect of Fox News larger than .5 percentage points

Table 4. Fox News and 2000-1996 Presidential Vote Share Change

Dep. Var.: Rep. Vote share change between 2000 & 1996 Pres. Elect.						
	Two-Party Vote Share					
	(1)	(2)	(3)	(4)	(5)	(6)
Fox News 2000	-0.0044	0.001	-0.0006	0.0015	-0.0011	0.0018
	(0.0011)***	(-0.0014)	(-0.0015)	(-0.0017)	(-0.0024)	(-0.0032)
Pres. Vote Chg. (92-88)					-0.0065	0.0001
					-0.0259	-0.0292
Demographic Controls	X	X	X	X	X	X
Control for Cable Features		X	X	X	X	X
State and District Fixed Effects			X	X	X	X
County Fixed Effects				X		X
R^2	0.3025	0.3292	0.5095	0.6615	0.5002	0.6626
N	*N = 8634*	*N = 8634*	*N = 8634*	*N = 8634*	*N = 3065*	*N = 3065*

Table 5a. Fox News and 2000-1996 Pres. Vote Share Change. Robustness

Dep. Var:.	Rep. Vote Share 2000	All-Party Vote Share	Right-Wing Vote Share
	(1)	(2)	(3)
Fox News 2000	-0.0005	0.0005	-0.0013
	(0.0014)	(0.0015)	(0.0015)
Republican Vote Share in 1996	0.8671		
	(0.0069)***		
Control Variables:			
Census 2000 and 1990	X	X	X
Cable System Controls	X	X	X
State and District Fixed Effects	X	X	X
R^2	0.9169	0.6092	0.4764
N	*N = 8634*	*N = 8634*	*N = 8634*

Table 5b. Fox News and 2000-1996 Pres. Vote Share Change. Robustness

Dependent Variable:	Two-Party Vote share 2000-1996				
	(4)	(5)	(6)	(7)	(8)
Fox News 2000	0.0009 (0.0012)	-0.002 (0.0017)		0.0001 (0.0017)	0.0007 (0.0016)
Fox News in Basic Package		0.0045 (0.0025)*			
Share of Population Subscribing to Fox News Cable Package			-0.0017 (0.0041)		
Control Variables:					
Census 2000 and 1990	X	X	X	X	X
Cable System Controls	X	X	X	X	X
State and District Fixed Effects	X	X	X	X	X
Outliers dropped	X				
Weighted Regression				X	
States with High Data Coverage					X
R^2	0.5492	0.5097	0.5094	0.6944	0.516
N	*N = 8461*	*N = 8634*	*N = 8570*	*N = 8634*	*N = 7484*

- Overall effect on 2000 elections?
  - Fewer than 50 percent of population receives Fox News in 2000
  - Total effect $\leq .5 * .005 * (105,000,000) \approx 250,000$ votes.

- Explain: Simple model of Fox News effect. Variables:
  - $r = P$(Republican and turn out to poll)
  - $d = P$(Democratic and turn out to poll)

- Town N (no Fox News). Vote share v_N:

$$v_N = \frac{r}{r+d}.$$

- Town F (Fox News).
  - $q = P$(listen to Fox News)
  - $f = P$(Non-Republican FN-listener convinced)
  - Vote share v_F:

$$v_F = \frac{r + (1-r)\,qf}{r + d + (1-r-d)\,qf}.$$

- Difference in vote shares $v_F - v_N$:

$$v_F - v_N = \frac{d}{r+d} \frac{qf}{t_F}$$

with $t_F \equiv (r + d + (1 - r)\, qf)$ turnout in town F

- Solve for f:

$$f = \frac{(v_F - v_N)}{q} \frac{t_F}{(1 - v_N)}$$

- Fraction convinced f higher if:
  - Effect on vote share $(v_F - v_N)$ higher
  - Exposure to Fox News q lower
  - Turnout t_F higher
  - Democratic vote share $(1 - v_N)$ lower

- Calibrate magnitudes:
  - $(v_F - v_N) = \hat{\beta}_F \leq .005$
  - $q = .35$ (Pew Survey: 17.5% listen to Fox News regularly, 28% sometimes)
  - $(1 - v_N) \approx .5$
  - $t_F \approx .5$

- Overall effect:

$$\begin{aligned} f &= \frac{(v_F - v_N)}{q} \frac{t_F}{(1 - v_N)} \\ &\leq \frac{.005}{.35} \frac{.5}{.5} \approx .015 \end{aligned}$$

- Convincing rate of Fox News: at most 1.5 percent

- Point estimate: $f = .004$

- Interpretations that do not go very far:
  1. **Contamination of treatment**
  2. **No change in media coverage**.
  3. **Selection of audience**.

- Our itnerpretations:
  1. **Sophistication** ($f \approx 0$).
     - Audience aware of bias (or skeptical of new channel)
     - Fox News as entertainment channel
  2. **Confirmatory bias** ($f \approx 0$)
     - Audience reinforces pre-existing opinions (Lord, Ross, and Lepper, 1979)

- Non-voters get reinforced also
- PREDICTION: Fox News should affect intensive margin (campaign contributions)

3. **Voting by identity** ($f \approx 0$)
   - Voting identity formed in early age
   - Maybe long-term effect of Fox News

3 Media: Media Focus

- Dyck and Zingales (2002): Manipulation of news about earnings

- Earning announcements in two formats:
  - GAAP (certified) earnings
  - Street earnings: GAAP minus one-time charges

- Company press release spins GAAP or street earnings

- Media can feature more prominently GAAP or street earnings

- Investors react to information with trading

- Data:
  - PR Newswire: Company release (first item)
  - Factiva: Newspaper coverage (first item)
  - Earning announcements:
    * 600 hand-searched
    * Stree earning from I/B/E/S
    * GAAP earnings from Compustat
  - Stock returns: Excess returns (-1,3)

- Use measure 1 of earning surprise for both Street and GAAP earnings (although forecasts are for street earnings)

- Form $s_{t,k}^{1,G}$ and $s_{t,k}^{1,S}$

- Define $d^{j}_{t,k} = 1$ if news is in media and presents first earning measure j $(j = S, G)$

- Specification:

$$\begin{aligned} r^{(,1,3)}_{t,k} &= \alpha + \beta_0 s^{1,G}_{t,k} + \beta_1 s^{1,S}_{t,k} + \\ & \beta_2 s^{1,G}_{t,k} d^{S}_{t,k} + \beta_3 s^{1,S}_{t,k} d^{G}_{t,k} + \\ & \beta_4 s^{1,G}_{t,k} d^{S}_{t,k} + \beta_5 s^{1,S}_{t,k} d^{G}_{t,k} + \varepsilon_{t,k} \end{aligned}$$

- Is there more response to Street (GAAP) earning when Street (GAAP) earnings are spinned?

- Table 3. Effect of Media Spin on stock response

- Too many variables. Could have more parsimoniou spec.

Table 3 - Does Media Coverage affect Asset Prices?

							Excluding news stories that mention stock market returns
	dependent variable = cumulative excess return						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GAAP earnings surprise	0.114		0.078	0.078	0.025	0.018	0.021
	[0.054]**		[0.058]	[0.057]	[0.046]	[0.047]	[0.047]
Street earnings surprise		0.29	0.207	0.208	0.376	0.378	0.377
		[0.136]**	[0.149]	[0.149]	[0.211]*	[0.213]*	[0.212]*
Spin on GAAP*GAAP earnings surprise					0.209	0.044	0.208
					[0.097]**	[0.110]	[0.098]**
Spin on GAAP*Street earnings surprise					-0.595	-0.642	-0.592
					[0.272]**	[0.246]***	[0.274]**
Spin on Street*Street earnings surprise					0.84	0.729	2.076
					[0.711]	[0.378]*	[1.015]**
Spin on Street*GAAP earnings surprise					-0.467	-1	-0.694
					[0.262]*	[0.365]***	[0.278]**
Only report Street *news*Street earnings surprise						2.618	
						[1.006]***	
Only report GAAP *news*GAAP earnings surprise						0.264	
						[0.112]**	
News				-0.005			
				[0.011]			
Observations	426	426	426	426	426	426	396
R-squared	0.02	0.02	0.02	0.02	0.05	0.08	0.05

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5 - Do Company Press Releases affect Asset Prices?

			Firms with below median number of analysts	Firms with above median number of analysts
dependent variable = cumulative excess return				
	(1)	(2)	(3)	(4)
GAAP earnings surprise	0.081	-0.052	0.018	-0.087
	[0.107]	[0.089]	[0.088]	[0.137]
Street earnings surprise	0.145	0.424	0.344	0.412
	[0.215]	[0.266]	[0.327]	[0.342]
Spin on Street in Company press release*GAAP earnings surprise	0.007	0.141	0.207	0.119
	[0.108]	[0.091]	[0.121]*	[0.132]
Spin on Street in Company press release*Street earnings surprise	0.303	0.217	0.213	0.052
	[0.265]	[0.374]	[0.550]	[0.565]
Spin on GAAP*GAAP earnings surprise		0.255	0.292	0.265
		[0.105]**	[0.117]**	[0.138]*
Spin on GAAP*Street earnings surprise		-0.607	-0.689	-0.326
		[0.297]**	[0.365]*	[0.379]
Spin on Street*Street earnings surprise		0.565	6.369	0.365
		[0.770]	[2.883]**	[0.667]
Spin on Street*GAAP earnings surprise		-0.521	-2.265	-0.446
		[0.261]**	[0.823]***	[0.327]
Observations	426	426	165	261
R-squared	0.03	0.06	0.15	0.05

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6 - Firm Spin and Media Spin

	logit		
	dependent variable: media report street first=1	dependent variable: media report street only	dependent variable: media report GAAP only
	(1)	(2)	(3)
Company reports street first	1.684 [0.393]***		
Company reports only street		2.197 [0.371]***	
Company reports only GAAP			1.753 [0.421]***
Observations	226	226	226

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

- Table 5. Response is mainly to media spin, not company spin per se

- Table 6. Company spin affects media spin

- Overall, media appear to:
  - focus attention (earning surprises)
  - affect consumer behavior some of the time (voter turnout vs. party chosen)
  - provide incentives for politicians (skipped)

- Is this mainly attention?

- Is it social learning?

- Is it persuasion?

- Open question

4 Imitation and Persuasion

- Stylized fact. In similar places people take actions
  - number of hours worked
  - effort at workplace
  - grades in school

- Peer effect literature:
  - Sacerdote (2001) – peer effects between Dartmouth undergrads. Small effect on grades
  - Kremer and Levy (2002) – peer effects among college student from alsohol use
  - Udry – social learning in pineapple fields
  - Ichino-Maggi (2001) – Peer effects in Italian bank – higher shirking in South

  - (Bunch of other papers – no peer effects)

- What determines similarity of actions?
  - Social learning?
  - Persuasion? (distaste for social disapproval coming from doing different things form social group)

- Finding clear example of persuasion withour social learning is first-order task

- Persuasion
- A clear psych. example
- *Milgram experiment*: post-WWII
- Do Germans yield to pressure more than others?
- Subjects: Adult males
- Recruitement: experiment on punishment and memory
- Roles:
  - teacher (subjects)

  - learner (accomplice)

- Teacher asks questions
- Teacher 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)
- Leaner visibly suffers and complains

- Results.
  - 62% subjects reach 450V
  - Subjects regret what they did ex post
  - When people asked to predict behavior, almost noone predicts excalation to 450V

- It's not the Germans — most people yield to social pressure

- Furthermore, naivete'

- A clear econ example
- Garicano, Palacios-Huerta, and Prendergast, *Favoritism Under Social Pressure*
- 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
- Do referees provide more injury time when it benefits more the home team?

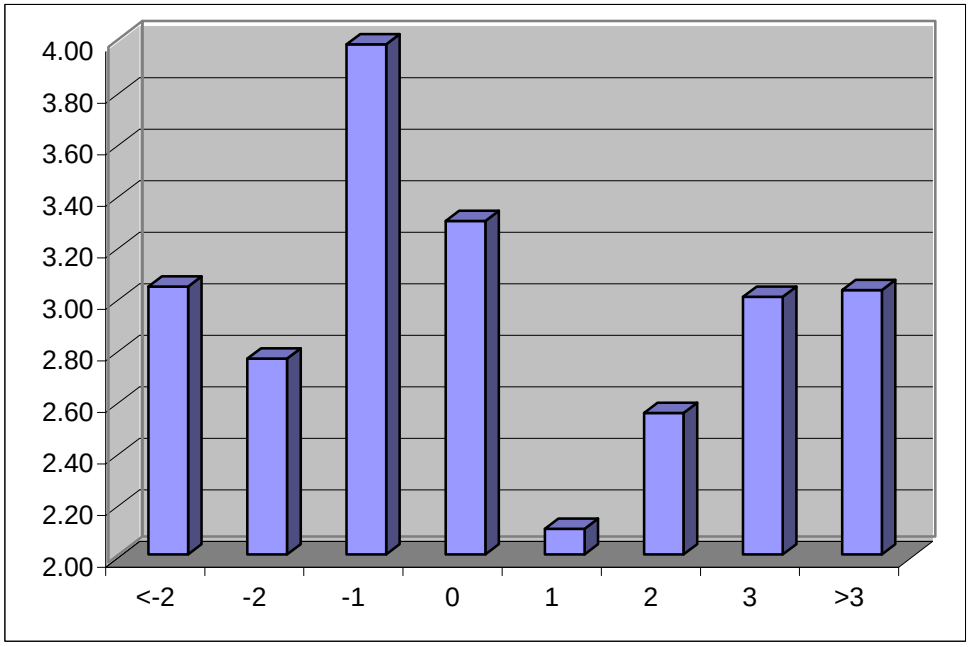
- Yielding to social pressure of public

- Note: referees professionals, are paid to be independent

- Results:
  - Figure 1
  - Table 2. Restrict sample to games with home team ahead by 1 or behind by 1.

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 (goals scored by home team - goals scored by visitors).



Note: 3.3% of the matches ended with score differences smaller than -2. 5.2% of the matches ended with score differences larger than 3.

TABLE 2.
MINUTES OF INJURY TIME AT END OF MATCH IN CLOSE MATCHES

The dependent variable is the length of injury time in matches that ended with a 1 goal difference. Controls are included for variables that may affect 'true' stoppages in the match. Score difference is 1 if home team finished ahead by 1 goal, 0 if home team finished behind by 1 goal.

	Score Difference	Yellow Cards	Red Cards	Player Substitutions	Year Effect	Budget Home	Budget Visitor	Rank Home	Difference in Rank[+] (home-vis)	Team Fixed Eff.	Constant	R Sq (N)
(1)	**-1.88****										3.98**	0.4852
	(0.12)										(0.09)	(268)
(2)	**-1.86****	0.08**	-0.2	0.14**							2.94**	0.5221
	(0.11)	(0.02)	(0.13)	(0.05)								(268)
(3)	**-1.86****	0.07**	-0.2	0.03	0.37*						3.28**	0.5328
	(0.11)	(0.02)	(0.13)	(0.07)	(0.15)						(0.31)	(268)
(4)	**-1.8****	0.06**	-0.19	0.04	0.29	-0.03	0.05*				3.21**	0.5492
	(0.11)	(0.02)	(0.13)	(0.07)	(0.17)	(0.02)	(0.02)				(0.31)	(268)
(5)	**-1.78****	0.06*	-0.19	0.04	0.11	0	0.05**	0.02	-0.03*		3.23**	0.5637
	(0.11)	(0.02)	(0.12)	(0.07)	(0.19)	(0.02)	(0.02)	(0.01)	(0.01)		(0.33)	(268)
(6)	**-1.77****	0.05*	-0.17	0.04	-0.09	0.06	0.05**	0.01	-0.03**	yes	3.28**	0.6025
	(0.12)	(0.03)	(0.13)	(0.07)	(0.37)	(0.1)	(0.02)	(0.03)	(0.01)	home	(0.6)	(268)
(7)	**-1.76****	0.06*	-0.16	0.02	0.52	-0.01	-0.02	0.02	-0.02*	yes	3.01**	0.6063
	(0.12)	(0.03)	(0.13)	(0.07)	(0.37)	(0.02)	(0.08)	(0.01)	(0.01)	visitor	(0.44)	(268)

Standard Errors In parenthesis * Significant at 5% level; ** Significant at 1% level; + Rank Difference: Absolute value of Rank Home- Rank Visitor.

- Is it imitation or (implicit) persuasion?

- Evidence from a field experiment

- Kristin

Clean Evidence on Peer Pressure

Armin Frank and Andrea Ichino

Econ 219B

presented by Kristin Kiesel

Motivation and Introduction

- Whether individual behavior is affected by peer pressure is of interest in many situations and disciplines
- Despite daily experience, limited success with regards to research findings due to data limitations:
  - Possible sorting according to local and personal attributes
  - Direction of causal relation
- Using a controlled field experiment, the paper provides evidence on the existence of peer pressure in a work environment

Definition of peer pressure (in paper):

A situation in which the output of individual *i* changes when the output of individual *j* is exogenously perturbed and nothing else changes .

Experimental Design

- Recruitment of 40 high-school students for one-time four hour job (90 Swiss Francs pay)
- Simple work task: fill letters into envelopes (e.g. preparation of a questionnaire)
- Four treatments:

Table 1: Treatments

Treatment	Number of subjects in each room	Information displayed
Base	1	none
Low	1	low output of three previous workers
High	1	high output of three previous workers
Pair	2	none (endogenous by output of other)

Behavioral Hypothesis

- Nash equilibria from : $\max U^i = G\left(X_i, Y^e, \theta_i\right) - L\left(X_i, \bar{X}_i^e\right)$

where X_i = level of output chosen by the individual

Y^e=vector of characteristics describing local environment

$G(.)$= gain from producing X_i, *with* $G_1>0$ *and* $G_{11}<0$

$L(.)$= cost of producing X_i (in absence of peer pressure $L_{12}=0$; with peer pressure $L_{12}\geq 0$

$\bar{X}^e_i$= average output of peers in which individual operates

θ_i = preference parameter (type of individual)

optimal output level : $X_i = g(\bar{X}_i^e, Y^e, \theta_i)$

Behavioral Hypothesis (cont.)

- Consider a linear version : $X_i = Y + \beta \bar{X}_i^e + \theta_i$

  where e now denotes the treatments

  ⇒ $\beta>0$, if positive peer pressure exists, $\beta<0$, if positive peer pressure exists

(Proposition 1): comparing the low and the high treatment, if peer pressure exists and $\bar{X}^l < \bar{X}^h$, then:

$$E\{X_i | e = l\} < E\{X_i | e = h\}$$

Proposition 2: In pair treatments, the higher the effect of peer pressure (i.e. the larger β), the smaller is the difference of output levels within pairs relative to between pairs

Proposition 3: In the presence of positive peer effects, the average output of the pair treatment exceeds that of single treatment.

Proposition 4: Given a pair of subjects working together, the one with the lower productivity when working alone is the one whose output increases more in the pair setting

Results

- Individuals seem to react to behavior of peers
- Difference at means are statistically significant for base and pairs treatment, low and high treatment, and low and pairs treatment

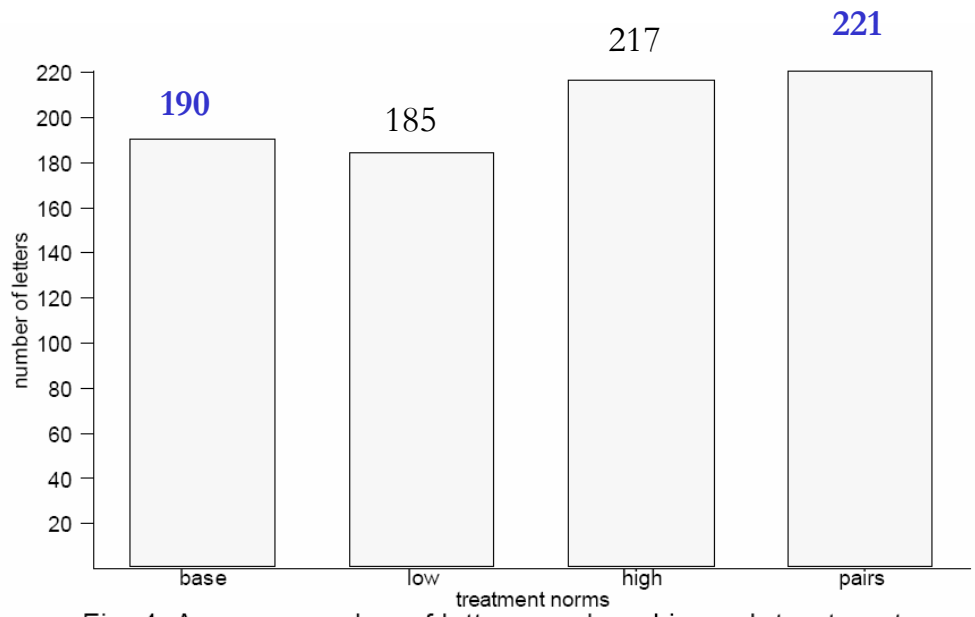


Fig. 4: Average number of letters produced in each treatment

Results (cont.)

- Response to peer pressure seems to monotonically decrease from low to higher productivity

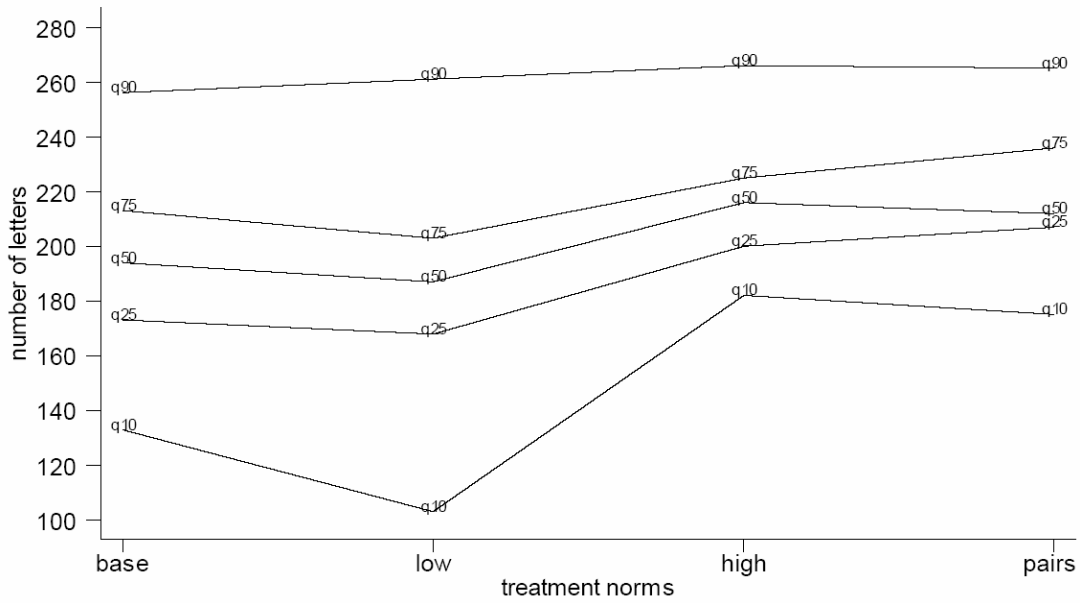


Fig. 5: Quantiles of the output distribution in each treatment

Results (cont.)

- Output level of two individuals working in same room are more similar than output levels of hypothetical pairs (two individuals working separately)

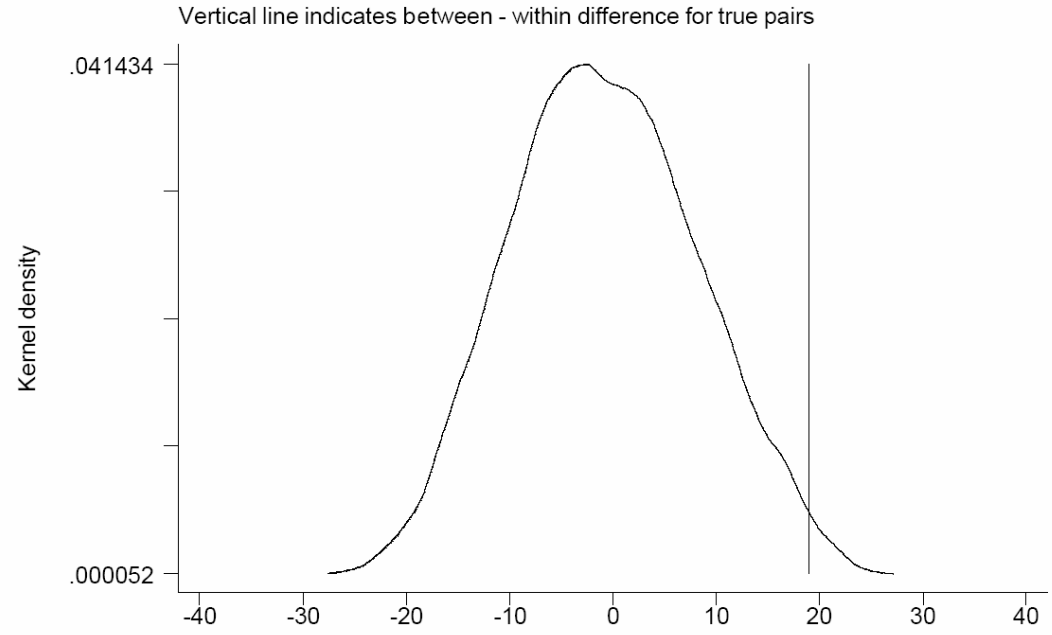


Fig. 8: Between - within st. dev. for true and hypothetical pairs

How "clean" is this evidence?

- Effect of peer pressure postulated using average output levels
- Very small sample size
- No information on individual characteristics (e.g. gender, age) and check of random assignment
- Effects of experimental design on results, especially with regard 2 initial low and high treatments
- (Differences at the mean are not statistically significant for all treatments e.g. base versus low, or base versus high treatment)
- Explanation of differences in effect on low versus high productivity characteristic
- Some evidence in the literature that sheer presence of others in simple tasks improves performance
- Other alternative explanations for findings (e.g. anchoring)
- Only address effects of peer pressure not it's determinants

5 Social Preferences

5.1 Introduction

- 219A. Emphasis on social preferences

- In the field?

  1. Pricing. When are price increases acceptable?

     – Kahneman, Knetsch and Thaler (1986)

     – Survey evidence

     – Effect on price setting

  2. Wage setting. Fairness toward other workers –> Wage compression

- Charness and Kuhn (2004).
- Classical gift exchange
- Type 1 and Type 2 worker, differently productive
- Workers do not know type of others, Firm knows
- Public treatment: workers observe own pay and pay of other
- Result: No effect of pay of others on own effort

3. Charitable Contributions.
   - Contributions of money and time
   - Survey by Andreoni (2004)

- Charitable contributions is only setting with field evidence

5.2 Charitable Contributions: Survey

- Andreoni (2004). Excellent survey of the theory and evidence on:
  - charitable contributions
  - contributions of time (short)
  - fundraising industry

- Stylized facts:
  - US Giving very large: 1.5 to 2.1 percent GDP!
  - Most giving by individuals (Table 1)
  - Slight trend to decrease in generosity (Figure 1)

- Giving by income, age, and education (Table 2 – no controls)
  - Giving as percent of income fairly stable
  - Increase for very rich

- Giving to whom? (Table 3)
  - Mostly for religion
  - Also: human services, education, health
  - Very little international donations

- Compare to giving in other countries (Figure 2)
  - In US non-profits depend more on Charitable contributions

over 183 billion dollars to charity, or 76% of the total dollars donated. The second biggest source, foundations, was responsible for 11.2% of all donations.

Table 1
Sources of Private Philanthropy, 2002

Source of gifts	Billions of dollars	Percent of total
Individuals	183.7	76.3
Foundations	26.9	11.2
Bequests	18.1	7.5
Corporations	12.2	5.1
Total for all Sources	240.9	100

Source: Giving USA, 2003

The trends in giving over the last 30 years can be seen in Figure 1. Total giving has been on a steady rise, with temporary jumps coming in 1986, along with a pronounced rise starting in 1996 trough 2001. When measured as a percent of income, however, giving seems much more stable. Since 1968 giving has varied from 1.5% to 2.1% of income. In the most recent years, however, giving has risen from 1.5% of income in 1995 to 2.1% in 2001. This rise coincided with a run up on stock-market wealth, which is the likely explanation for the latest increase in giving. Notice, however, that this latest rise in giving counteracts a longer trend of slowly falling generosity. The peak of giving in 2001 matches the former peak set back in 1963. Table 2 presents details on the characteristics of individual givers. The data, from the Independent Sector in 1995, show that 68.5% of all households gave to charity and that the average gift among those giving was $1081. Table 2 shows that the more income a household has, the more likely the household is to give to charity, and the more it gives when it does donate. This table also reveals an interesting pattern typically found in charitable statistics. Those with the lowest incomes give over 4% of income to charity. As incomes grow to about $50,000, gifts fall to 1.3% of income, but then rise again to 3.0% for the highest incomes. What could cause this "u-shaped" giving pattern? One explanation is that those with low incomes may be young people who know their wages will be rising, hence they feel they can afford more giving now. It may also be due to the composition of the types of charities people give to, since lower income people tend to give significantly more to religious causes. Hence, it will be important to account for all the factors that may explain giving before offering explanations for the averages seen in these tables.

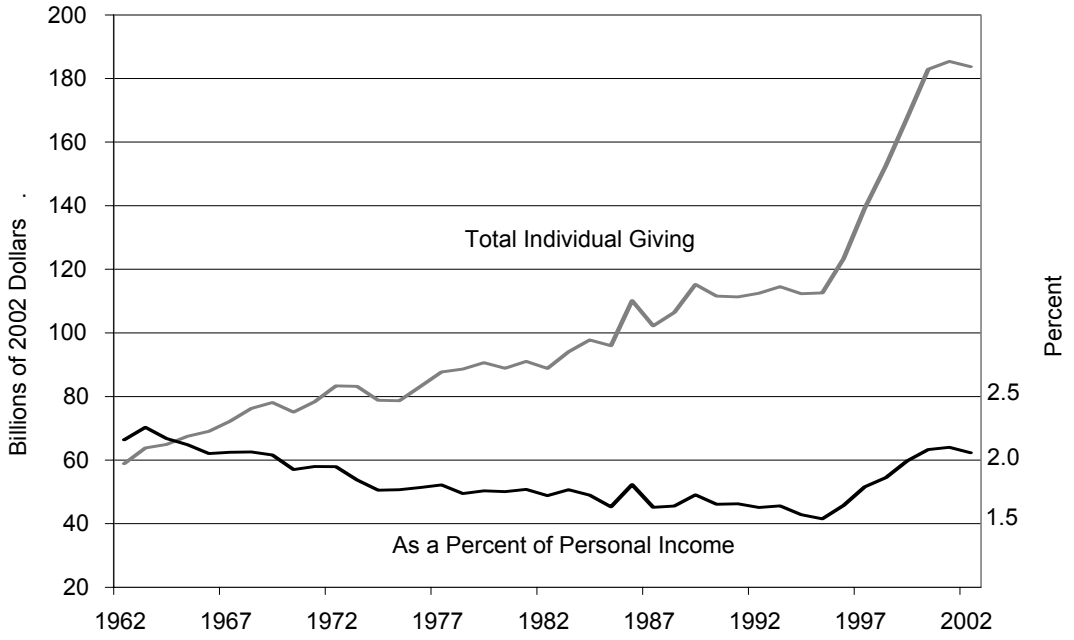


Figure 1: Trends in Individual Giving.
Source: Giving USA 2003.

Table 2 also illustrates that giving varies significantly with the age and educational attainment of the givers. As people get older they are typically more likely to give to charity and to give a greater fraction of their incomes. Likewise, those with more education give more often, give more dollars, and generally give a higher fraction of income. Note that the table does not show a smooth acceleration of giving with age. Again, age, education, and income all vary with each grouping in the table and will have to be considered jointly.

In 1997 over 45,000 charitable, religious and other non-profit organizations filed with the US government (see Bilodeau and Steinberg in this volume). Table 3 attempts to categorize these charities by the types of services they provide. This reveals that, among all types, households are most likely to give to religious organizations and to give them the most money—48% of all households give to religion and 59% of all charitable dollars go to religion.

Table 2
Private philanthropy by income, age, and education of the giver, 1995

	Percent of households who give	Average amount given by those who give	Percent of household income
All contributing households	68.5	1,081	2.2
Household Income			
under $10,000	47.3	324	4.8
10,000–19,000	51.1	439	2.9
20,000–29,999	64.9	594	2.3
30,000–39,999	71.8	755	2.2
40,000–49,999	75.3	573	1.3
50,000–59,999	85.5	1,040	1.9
60,000–74,999	78.5	1,360	2.0
75,000-99,999	79.7	1,688	2.0
100,000 or above	88.6	3,558	3.0
Age of Giver			
18–24 years	57.1	266	0.6
25–34 years	66.9	793	1.7
35–44 years	68.5	1,398	2.6
45–54 years	78.5	979	1.8
55–64 years	71.7	2,015	3.6
65–74 years	73.0	1,023	2.9
75 years and above	58.6	902	3.1
Highest Education of Giver			
Not a high school graduate	46.6	318	1.2
High school graduate	67.2	800	1.9
Some college	74.1	1,037	2.1
College graduate or more	82.3	1,830	2.9

Source: Author's calculations, data from Independent Sector 1995.

Table 3
Private Philantropy by Type of Charitable Organization, 1995.

Type of Charity	Percent of Households who give	Average amount given by those who give	Percent of total household contributions
Arts, culture and humanities	9.4	221	2.6
Education	20.3	335	9.0
Environment	11.5	110	1.6
Health	27.3	218	8.1
Human Services	25.1	285	9.5
International	3.1	293	1.1
Private and community foundations	6.1	196	1.4
Public or Societal benefit	10.3	127	1.7
Recreation	7.0	161	1.4
Religious	48.0	946	59.4
Youth Development	20.9	140	3.8
Other	2.1	160	0.3

Source: Author's calculations, data from Independent Sector, Giving and Volunteering, 1995.

2.2. International Statistics

A difficult aspect of comparing data from across countries is the varied sources of information and the inconsistent definitions of charitable giving and non-profit organizations. Using data from Johns Hopkins Comparative Nonprofit Sector Project[6], we can nonetheless attempt to gain some perspective on the differing size of the charitable sectors of various economies.

Figure 2 shows reports of cash revenues of non-profits from philanthropy. The experience varies widely around the globe. The US, however, stands out as being the most reliant on private donations, at 21 percent of all revenues. With the exception of Spain, European countries are much lower, varying from 3 to 11 percent. The South American countries of Argentina and Brazil rely heavily on philanthropy (about 18 percent), while Mexico does not (6 percent).

[6]See their web-site, http://www.jhu.edu/~cnp/.

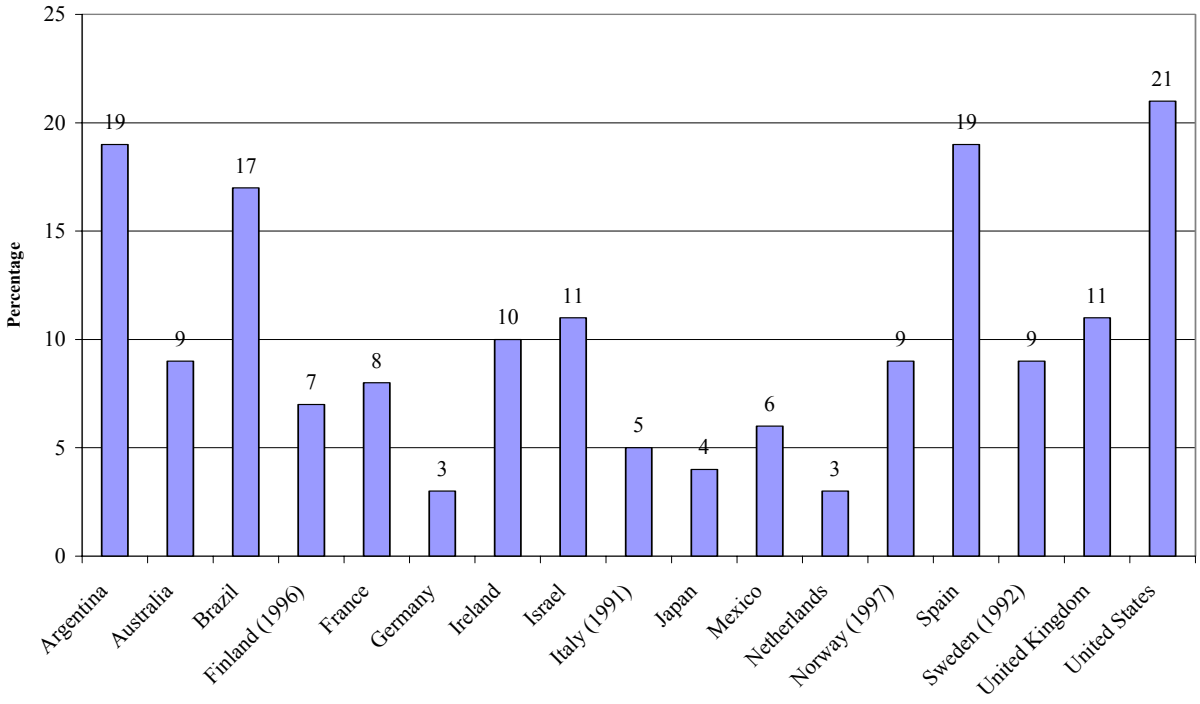


Figure 2: Percentage of Cash Revenues of the Nonprofit Sector Received from Philanthropy: 1995.

Figure 3 provides a different perspective by looking at the total expenditures of the non-profit sector. Here the US falls closer to the middle of the pack, at 7.5 percent of GDP. The Netherlands and Israel have the largest non-profit sectors, while Mexico and Brazil have the smallest.

- (Very) stylized model

- 2-person economy:
  - Mark has income M_M and consumes c_M
  - Wendy has income M_W and consumes c_W
  - One good: c, with price $p = 1$

- Utility functions: $u(c)$, with $u' > 0$, $u'' < 0$

- Wendy is altruistic: she maximizes $u(c_W)+\alpha u\,(c_M)$ with $\alpha > 0$

- Mark simply maximizes $u(c_M)$

- Wendy can give a donation of income D to Mark.

- Mark maximizes

$$\max_{c_M} u(c_M)$$
$$s.t.\ c_M \leq M_M + D$$

- Solution: $c_M^* = M_M + D$

- Wendy maximizes

$$\max_{c_M, D} u(c_W) + \alpha u\left(M_M + D\right)$$
$$s.t.\ c_W \leq M_W - D$$

  or

$$\max_{D} u(M_W - D) + \alpha u\left(M_M + D\right)$$

- First order condition:

$$-u'(M_W - D^*) + \alpha u'\left(M_M + D^*\right) = 0$$

- Second order conditions:

$$u''(M_W - D^*) + \alpha u''\left(M_M + D^*\right) < 0$$

- Assume $\alpha = 1$.
  - Solution?
  - $u'(M_W - D) = u'(M_M + D^*)$
  - $M_W - D^* = M_M + D^*$ or $D^* = (M_W - M_M)/2$
  - Transfer money so as to equate incomes
  - $D < 0$ (negative donation!) if $M_M > M_W$

- Corrected maximization:

$$\max_D u(M_W - D) + \alpha u(M_M + D)$$
$$s.t. D \geq 0$$

- Solution ($\alpha = 1$):

$$D^* = \begin{cases} (M_W - M_M)/2 & \text{if } M_W - M_M > 0 \\ 0 & \text{otherwise} \end{cases}$$

- Allow $\alpha \leq 1$. Assume interior solution. ($D^* > 0$)

- Comparative statics 1 (altruism):

$$\frac{\partial D^*}{\partial \alpha} = -\frac{u'\left(M_M + D^*\right)}{u''(M_W - D^*) + \alpha u''\left(M_M + D^*\right)} > 0$$

- Comparative statics 2 (income of donor):

$$\frac{\partial D^*}{\partial M_W} = -\frac{-u''\left(M_W + D^*\right)}{u''(M_W - D^*) + \alpha u''\left(M_M + D^*\right)} > 0$$

- Comparative statics 3 (income of recipient):

$$\frac{\partial D^*}{\partial M_M} = -\frac{\alpha u''\left(M_M + D^*\right)}{u''(M_W - D^*) + \alpha u''\left(M_M + D^*\right)} < 0$$

- Reality check for these comparative statics

- Richer people donate more (as total). Good.

- BUT: Do poorer people receive more? Not obvious

- Donate to person with highest marginal utility in more general model

- Table 3: Very little international donations –> Limited donations to poorest countries

- Additional prediction of model – Crowding out

- If government spends on income of Mark, Wendy will donate less.

- What is the evidence of crowding out?

- Mixed evidence – open question

- Some open questions for field data work:

- Why do people donate?
  - Altruism?
  - Warm glow? What does it mean?
  - Social pressure?
  - Emotional connection?

- How sensitive are donors to features of charities?
  - Expense ratio
  - Marginal utility of recipient
  - (Psychological) Distance of donor from recipient

  - Previous donations (see below)
  - Gifts (see below)

- Non-profits are willing to run field experiments (they do them anyway)

5.3 Charitable Contributions: Field Experiments

- Christine

The Effects of Seed Money and Refunds on Charitable Giving: Experimental Evidence from a University Capital Campaign

By John List and David Lucking-Reiley, JPE 2002

Outline

- Charities
- List and Lucking-Reiley (L & L-R) Hypotheses
- Experiment Setup
- Results

Social Preferences

Preferences for distribution of resources

- In ultimatum game, Nash equilibrium says that everyone should donate nothing.
- But we observe people donate to charities.

How can we increase contributions?

Seed Money

Refund policy

List & Lucking-Reiley look at effects of these two tactics on a capital campaign.

- Capital campaign (as opposed to a continuing campaign) helps finance a new project that has a fixed cost.
- Continuing campaign helps finance something that already exists for maintenance.

LLR Compare Underlying Theories of Two Tactics

- Andreoni Theory (Seed)
  - Small group of "leadership givers" act as a seed to grow a successful major capital fund drive; seed is publicly announced.
- Bagnoli and Lipman Theory (Refund)
  - Getting money back if charity does not raise enough to meet fixed cost of public good improves chances of getting public good.

Motivation for Theories

- Andreoni: Cost of public good is lower.
  - Prize is more in sight, so people are willing to donate.
- Bagnoli and Lipman: Refund policy reduces free-riding.
  - But with charities, why should there be free-riding? Donors do not get portion of public good back. Public good is a misnomer.
  - Difference between ultimatum game/charity and public good game.

Andreoni (1998)

- Let P = Total donation such that everyone is at least indifferent between giving a donation and keeping it (entire endowment)
- Let C = fixed cost or threshold needed in order to "buy" public good
- Let N = Total donation of the unique interior Nash equilibrium

Case 1	P<C	Eq: 0
Case 2	P<C<N	Eq: 0 or N
Case 3	C = N	Eq: N
Case 4	P>C	Eq: N

Seed money either lowers P or lowers C!

Bagnoli & Lipman (1989)

according to L & L-R

- Actual paper is not easy to read
- Refund policy: get money back if group does not reach a certain fixed cost
- "Implementing refund policy may move the outcome from an inefficient level (not providing public good, e.g. getting computer) to an efficient one (providing good)"
- Outcome effect not level effect

LLR Charity Experiment

- Who
  - University of Central Florida's Center for Environmental Policy Analysis
- What
  - Public good = computer worth $3000
  - $3000 is the fixed cost/threshold, any cash over was used for salaries and maintenance of facility
- How
  - Direct mailings

Experimental Design

Found 3000 Floridans whose
1. Annual income > $70,000
2. Household known to have previously given to charity

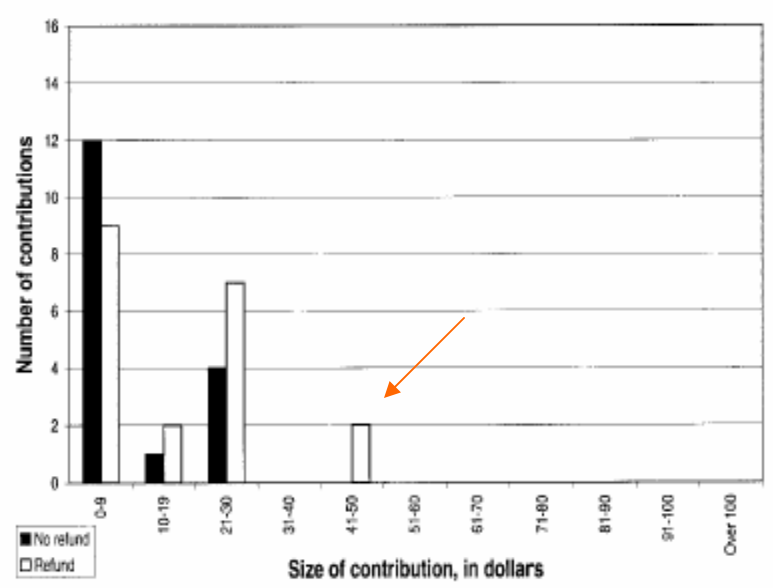
→ Randomly divided people into 6 groups of 500 people

Mailed 6 Charity Letters (Treatments)

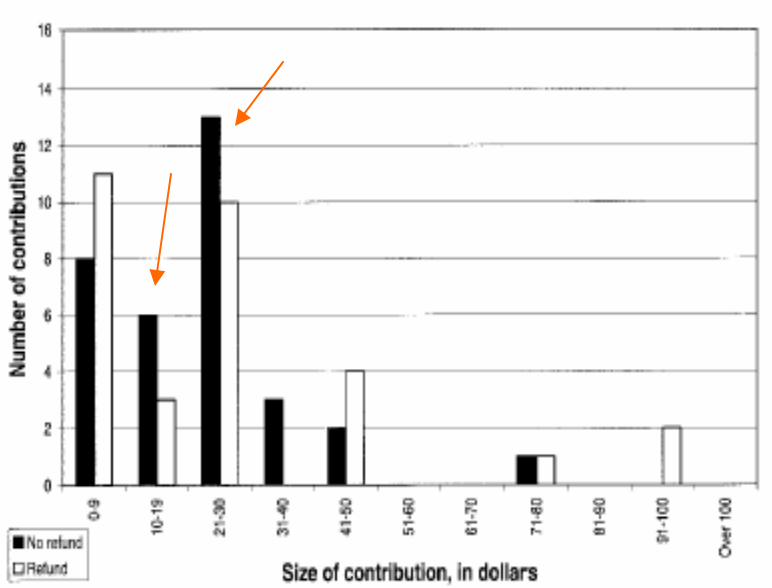
Treatment Group	Seed Money	Refund
10	10% = $300	No
10R	10% = $300	Yes
33	33% = $1000	No
33R	33% = $1000	Yes
66	66% = $2000	No
66R	66% = $2000	Yes

TABLE 1
RESULTS OF THE FIELD EXPERIMENT

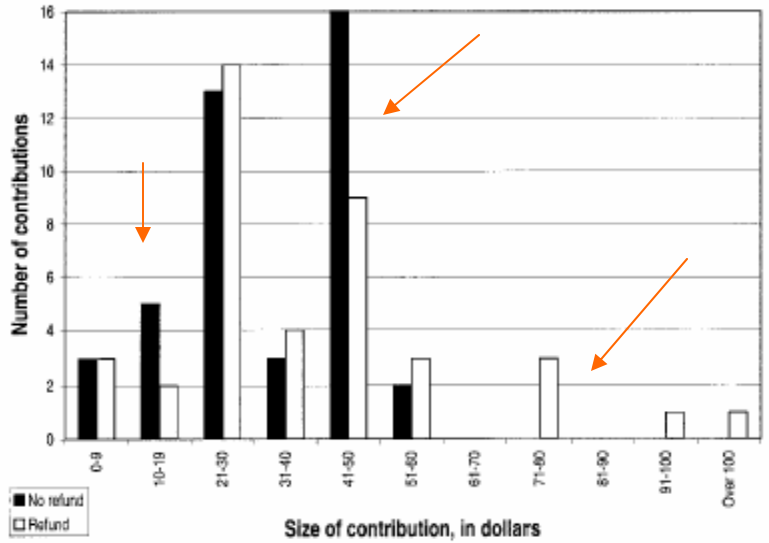
	10	10R	33	33R	67	67R
	A. Experimental Design					
Number of solicitations mailed	500	500	500	500	500	500
Seed money (%)	10%	10%	33%	33%	67%	67%
Seed money ($)	$300	$300	$1,000	$1,000	$2,000	$2,000
Refund offered?	no	yes	no	yes	no	yes
	B. Results					
Number of contributions	17	20	33	31	42	40
Participation rate	3.4%	4.0%	6.6%	6.2%	8.4%	8.0%
Total contributions	$202	$379	$805	$863	$1,485	$1,775
Mean amount given	$11.88	$18.95	$24.39	$27.84	$35.36	$44.38
Standard error of mean amount	$2.27	$3.13	$2.50	$4.59	$2.26	$6.19



10 vs 10R



33 vs 33R



66 vs 66R

Main Results I

- Larger seed money increases the participation rate, total contribution, average donation, and number of donations
- Refund policy (slightly) increases total contribution, average donation, but has no effect on participation rate
- Only 66 and 66R received enough donations to get the computer

Main Results II

- Donation distribution shifts to right with both seed money and refund policy
- Either low donors switch to paying more or tactics are targeting a different donor (i.e. low ones out, high ones in)
- Not very many people donating ~180/3000

Significant Differences Tests

- Participation rates
- Average contribution
- Example: Participation rates for 10 and 33 (pooling R and no R)
  - Assume everyone donates based on a binomial distribution (p) where p is probability of donating
  - $P_{10(R)} - P_{33(R)} \;/\; se(P_{10(R)} - P_{33(R)})$

    $= [0.037-0.064]/sqrt[Var(P_{10(R)})+Var(P_{33(R)})]$

    $= [0.037-0.064]/sqrt[1/1000\text{^}2*1000*\ 0.037(1-\ 0.037) +$
    $1/1000\text{^}2*1000*\ 0.064(1-\ 0.064)]$

    $= 2.76 \sim t_{98}$

Discussion

- Andreoni says that there are at most two equilibria (discontinuity). Field evidence demonstrates that continuous relationship between seed money and contributions. Equilibrium concept is not normative.
- Bagnoli and Lipman say that the outcome of getting public good should change if have refund policy. While evidence shows that contributions are higher, outcomes do NOT change per seed money level.
- Field vs Lab: Refund policy has a smaller effect in field than in lab ➔ in lab, donating = burning; in field, donating = still good
- Because have to refund extra money if do not make target level, no-refund charities actually made more money than refund charities.

Alternative Explanations

- Andreoni and B&L theories are not behavioral models but are equilibrium concepts.
- Incomplete information about other players' preferences (Andreoni assumes complete information)
- Cost of participating (e.g. reading)
- Vesterlund (1999): more seed money = higher quality of charity
- Seed = signal for "right" amount of money to give (i.e. anchoring)

Conclusions

Main Points

- Seed money positively effects
  - participation rate
  - total contribution
  - average donation
  - number of donations
- Refund policy positively effects
  - total contribution
  - average donation (slightly)

Comments

- Clean setup
- Unintuitive results with seed money
- Is there free-riding with charities? Are people attached to getting a computer?
- Attrition (number of letters mailed back to sender)
- Robustness: Varying target number
- How to make charities more profitable…

6 Summary of Evidence

- Update type of evidence encountered so far

1. Empirical evidence of type 1 (Benartzi and Thaler, 2004; Choi et al.:, 2001; Huberman and Regev, 2001; Madrian and Shea, 1999; Wolfers and Zitzewtiz, 2003):
   - **Time Series** (or **Event Study**) evidence
   - At time t, change in regime
   - Simple difference: Look at (After t - Before t)
   - Worries:
   (a) Endogeneity of change
   (b) Other changes occurring at same time
   (c) How many observations? Maybe $n = 1$?

2. Empirical evidence of type 2 (DellaVigna and Malmendier, 2004; Miravete, 2004; Sydnor, 2004; Soules, 2004):

   - **Contract choice** evidence
   - Need to observe:

   (a) menu of options

   (b) later utilization

   - Use revealed preferences to make inferences from contract choice in (a)
   - Compare to actual utilization in (b)
   - Worries: hard to distinguish unusual preferences (self-control) and wrong beliefs (naiveté, overconfidence)

3. Empirical evidence of type 3 (Ariely and Wertenbroch, 2002; Ausubel, 2004; Duflo and Saez, 2003; Fehr and Goette, 2004; Ho and Imai, 2004; Hossain and Morgan, 2003; List's work):

   - **Field or natural experiment** evidence

   (a) Naturalistic setting

   (b) Randomize tratment

   - Observe effect of treatment
   - Plus: Randomization ensures clean identification
   - Minus: Not easy to run
   - Great if you can find natural experiment (Ausubel and Ho and Imai)

4. Empirical evidence of type 4 (George and Waldfogel, 2002; DellaVigna and Kaplan, 2004):

   - **Difference-in-Difference** evidence

   (a) Naturalistic setting

   (b) Compare effect of change in treated and untreated group

   - Refined version of Empirical Evidence 1

   - Minus: Worry whether control group is a good control

   - Minus: Worry about endogeneity of change

5. Empirical evidence of type 5 (Barber and Odean, 2004; Camerer et al., 2001; DeGeorge et al., 1999; Farber, 2004; Genesove and Mayer, 2003; Odean, 1998):

   - **Observational study**

   (a) Observe correlation between variables

   (b) (Estimate parameters)

   (c) Test prediction based on theory

   - Most commonly available evidence
   - Structural estimation?
   - Minus: Hard to infer causality
   - Minus: Hard unless theory makes sign prediction on correlation