

Econ 219B  
Psychology and Economics: Applications  
(Lecture 9)

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## Outline

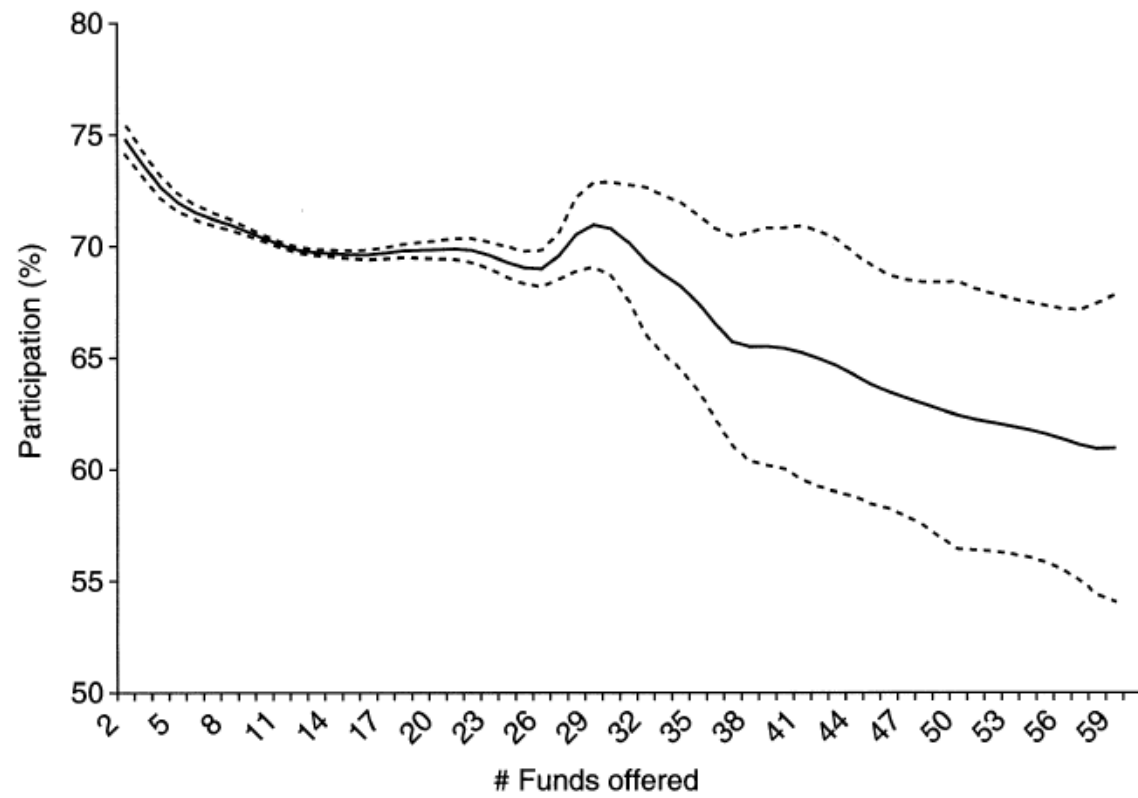
1. Menu Effects: Choice Overload
2. Social Pressure
3. Persuasion

# 1 Menu Effects: Choice Overload

- Last lecture: effect of heuristics on choice from menu of options:
  - Excess Diversification
  - Use of Irrelevant Information (Order, ...)
- Today: More dramatic response — Refusal to choose with choice overload

- **Choice Overload.** Classical Experiment (Yiengar and Lepper, 2000)
  - Up-scale grocery store in Palo Alto
  - Randomization across time of day of number of jams displayed for taste
    - \* Small number: 6 jams
    - \* Large number: 24 jams
  - Results:
    - \* More consumers sample with Large no. of jams (145 vs. 104 customers)
    - \* *Fewer* consumers buy with Large no. of jams (4 vs. 31 customers)

- Field Evidence: **Iyengar, Huberman, and Lepper (2006)**
- Data set from Fidelity on choice of 401(k) plans
- (Same as for Huberman and Jiang on  $1/N$ )
- Comparison of plans with few options and plans with many options
- Focus on participation rate – Fractions of employees that invest



- Participation rate is decreasing in number of funds

- Field Evidence 2: **Bertrand, Karlan, Mullainathan, Zinman (2006)**
- Field Experiment in South Africa
  - South African lender sends 50,000 letters with offers of credit
  - Randomization of interest rate (economic variable)
  - Randomization of psychological variables
  - Crossed Randomization: Randomize independently on each of the  $n$  dimensions
    - \* Plus: Use most efficiently data
    - \* Minus: Can easily lose control of randomization

**Table 2**  
**Summary of Randomized Interventions<sup>a</sup>**

	(1)	(2)	(3)	(4)	(5)
Sample:	All	Customers who did not take up	Customers who took up	“High attention” customer	“Low attention” customer
September wave	0.395 (0.49)	0.394 (0.49)	0.401 (0.49)	0.398 (0.49)	0.393 (0.49)
October wave	0.605 (0.49)	0.606 (0.49)	0.599 (0.49)	0.602 (0.49)	0.607 (0.49)
Offer Interest Rate	7.929 (2.42)	7.985 (2.42)	7.233 (2.31)	6.970 (2.11)	8.384 (2.43)
Small option table	0.432 (0.50)	0.438 (0.50)	0.349 (0.48)	0.250 (0.43)	0.518 (0.50)
No comparison to competitor	0.200 (0.40)	0.200 (0.40)	0.200 (0.40)	0.202 (0.40)	0.199 (0.40)
comparison expressed as a gain	0.401 (0.49)	0.400 (0.49)	0.408 (0.49)	0.397 (0.49)	0.403 (0.49)
No photo on mailing	0.202 (0.40)	0.202 (0.40)	0.206 (0.40)	0.198 (0.40)	0.204 (0.40)
Black photo	0.477 (0.50)	0.477 (0.50)	0.476 (0.50)	0.488 (0.50)	0.472 (0.50)
Coloured photo	0.071 (0.26)	0.071 (0.26)	0.071 (0.26)	0.072 (0.26)	0.071 (0.26)
Indian photo	0.125 (0.33)	0.125 (0.33)	0.122 (0.33)	0.123 (0.33)	0.126 (0.33)
White photo	0.124 (0.33)	0.124 (0.33)	0.125 (0.33)	0.120 (0.32)	0.127 (0.33)
Female photo	0.399 (0.49)	0.398 (0.49)	0.411 (0.49)	0.398 (0.49)	0.399 (0.49)
Male photo	0.399 (0.49)	0.400 (0.49)	0.383 (0.49)	0.404 (0.49)	0.397 (0.49)
Photo matches customer’s race?	0.534 (0.50)	0.535 (0.50)	0.531 (0.50)	0.537 (0.50)	0.533 (0.50)
Photo matches customer’s gender?	0.401 (0.49)	0.402 (0.49)	0.388 (0.49)	0.403 (0.49)	0.400 (0.49)
Promotional lottery	0.250 (0.43)	0.251 (0.43)	0.246 (0.43)	0.250 (0.43)	0.251 (0.43)
Suggestion call	0.003 (0.05)	0.003 (0.05)	0.005 (0.07)	0.003 (0.05)	0.003 (0.05)
Sample	53194	49250	3944	17108	36086



- Manipulation of interest here:
  - Vary number of options of repayment presented
    - \* Small Table: Single Repayment option
    - \* Big Table 1: 4 loan sizes, 4 Repayment options, 1 interest rate
    - \* Big Table 2: 4 loan sizes, 4 Repayment options, 3 interest rates
    - \* Explicit statement that “other loan sizes and terms were available”
  - Compare Small Table to other Table sizes
  - Small Table increases Take-Up Rate by .603 percent
  - One additional point of (monthly) interest rate decreases take-up by .258

**Table 3 Effect of Simplicity  
of Offer Description on Take-Up<sup>a</sup>**

Dependent Variable: Take-Up Dummy			
Sample:	All	High attention	Low attention
	(1)	(2)	(3)
Small option table	0.603 (0.239)	1.146 (0.674)	0.407 (0.219)
$\Delta$ interest rate equivalent	[2.337]	[3.570]	[1.887]
Interest rate	-0.258 (0.049)	-0.321 (0.145)	-0.215 (0.044)
Risk category F.E.?	yes	yes	yes
Experimental wave F.E.?	yes	yes	yes
Sample size	53194	17108	36086

- Small-option Table increases take-up by equivalent of 2.33 pct. interest

- Strong effect of behavioral factor, compared with effect of interest rate
- Effect larger for 'High-Attention' group (borrow at least twice in the past, once within 8 months)
- Authors also consider effect of a number of other psychological variables:
  - Content of photo (large effect of female photo on male take-up)
  - Promotional lottery (no effect)
  - Deadline for loan (reduces take-up)

## 2 Social Pressure

- Stylized fact. In similar places people take actions
  - number of hours worked
  - effort at workplace
  - grades in school
- Problem:
  - Could be selection of similar people into similar situations
  - Could be common shock

- Peer effect literature → Use random assignment to identify impact:
  - **Sacerdote (2001)** – peer effects between Dartmouth undergrads. Small effect on grades
  - **Kremer and Levy (2002)** – peer effects among college student from alcohol use
  - (Number of other papers – many find no peer effects)
- Next problem: What determines similarity of actions?
  - Social learning?
  - Social Pressure? (distaste for social disapproval coming from doing different things form social group)
  - Persuasion?

- Clear example of social pressure without social learning
- *Milgram experiment*: post-WWII
- Motivation: Do Germans yield to pressure more than others?
  - Subjects: Adult males in US
  - Recruitment: experiment on punishment and memory
  - Roles:
    - \* teacher (subjects)
    - \* learner (accomplice)
  - Teacher asks questions

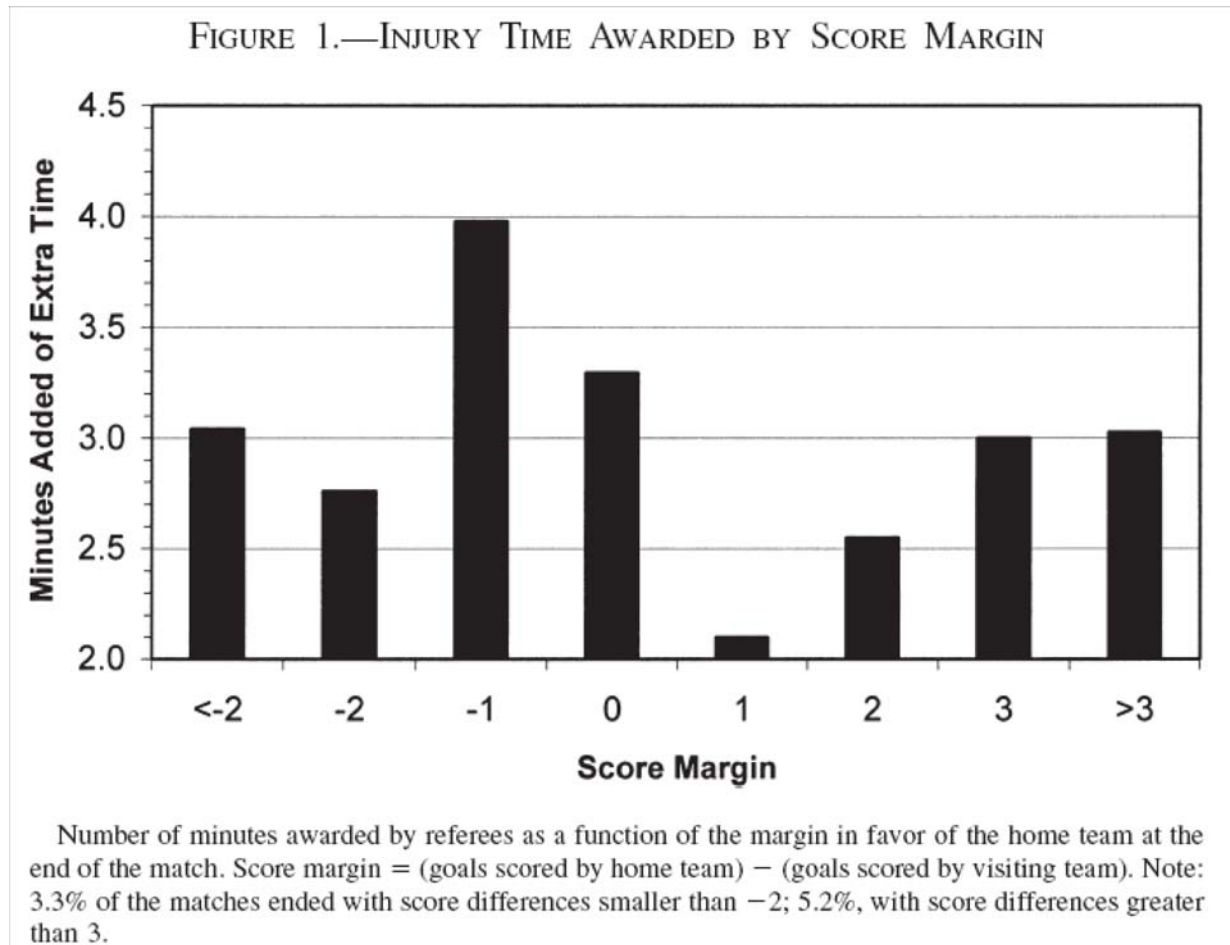
- Teacher administers shock for each wrong answer
  - Initial shock: 15V
  - Increase amount up to 450V (not deadly, but very painful)
  - Learner visible through glass (or audible)
  - Learner visibly suffers and complains
- Results:
    - 62% subjects reach 450V
    - Subjects regret what they did ex post
    - When people asked to predict behavior, almost no one predicts escalation to 450V

- It's not the Germans (or Italians)! 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



- An example of social pressure in a public event
- **Garicano, Palacios-Huerta, and Prendergast (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: Figure 1 – Clear pattern, very large effects



- 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>	<b>-1.53**</b> <b>(0.18)</b>	<b>-1.56**</b> <b>(0.18)</b>
<i>Year Effect</i>	0.81** (0.18)	0.7** (0.21)
<i>Year × Score Difference</i>	<b>-0.58*</b> <b>(0.23)</b>	<b>-0.52*</b> <b>(0.23)</b>
<i>Yellow Cards</i>		0.07** (0.02)

- 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>	<b>-0.93**</b> <b>(0.20)</b>	<b>-0.96**</b> <b>(0.21)</b>
<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>	<b>-0.02**</b> <b>(0.00)</b>	<b>-0.02**</b> <b>(0.00)</b>
<i>Yellow Cards</i>		0.07** (0.02)
<i>Budget Home</i>		

- **Mas and Moretti (2006)**. Evidence of response to social pressure in the workplace
  - Workplace setting → Large retail chain
  - Very accurate measure of productivity, scanning rate
  - Social Pressure: Are others observing the employer?
  
- Slides courtesy of Enrico

# Introduction

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- We use internal scanner data from a supermarket chain to obtain a high-frequency measure of productivity of checkers
- Over a two year period, we observe each item scanned by each worker in each transaction. We define individual effort as the number of items scanned per second.
- We estimate how individual effort changes in response to changes in the average productivity of co-workers

# Introduction

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- Over the course of a given day, the composition of the group of co-workers varies, because workers shifts do not perfectly overlap
- Scheduling is determined two weeks prior to a shift  
=> within-day timing of entry and exit of workers is predetermined
- Empirically, entry and exit of good workers appear uncorrelated with demand shocks:
  - The entry of fast workers is not concentrated in the ten minutes prior to large increases in customer volume, as would be the case if managers could anticipate demand changes
  - The exit of fast workers is not concentrated in the ten minutes prior to large declines in customer volume
  - The mix of co-workers ten minutes into the future has no effect on individual productivity in the current period.

## Preview of results

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- (1) The introduction of a high-productivity worker into the checkout stand is associated with a significant *increase* in incumbent worker effort
  - (2) Spillovers depend on workers' ability to monitor one another and frequency of interactions
    - (a) A given worker's effort is positively related to the speed of workers who face him, but not the speed of workers whom he faces
    - (b) Workers respond more to the presence of co-workers with whom they frequently overlap
- => Social pressure is the mechanism that generate peer effects



## Preview of results

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(3) The magnitude of the spillover varies depending on the skill level of the relevant worker: it is large for slow workers, and is small for fast workers

=> The optimal mix of workers is the one that maximizes skill diversity in a shift

(4) By optimally arranging the mix of workers, this firm could generate the same amount of sales with 124,000 fewer hours of work each year. This is *not* inconsistent with profit maximization.

## Why are spillovers important?

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- What is the true benefit of hiring a high productivity worker?
- What is the optimal workplace organization? Can we increase output by simply re-arranging the mix of workers in each shift?
- Getting inside the black-box of productivity spillovers
- What motivates workers in jobs with fixed-pay?

## Literature on Peer Effects in School

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- Our question is methodologically similar to the question addressed in the literature on peer effects in education.
- Should we minimize or maximize variance of students?
- Empirical Evidence
  - Sacerdote (2001)
  - Hanushek et al. (2000)
  - Vigdor and Nechyba (2004)
  - Graham (2005)
- Methodological issues
  - Graham, Imbens and Ridder, 2006
  - Imbens and Ridder, 2005

# Data

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- 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

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- 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?

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- 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)
$\Delta$ 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 1: There is a positive association between changes in co-worker permanent productivity and changes in individual productivity

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Entry of above average productivity worker	0.011 (0.001)	
Exit of an above average productivity worker	-0.005 (0.001)	
Shift entry of above average productivity worker		0.006 (0.002)
Shift exit of an above average productivity worker		-0.006 (0.002)
Controls	Yes	Yes

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

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

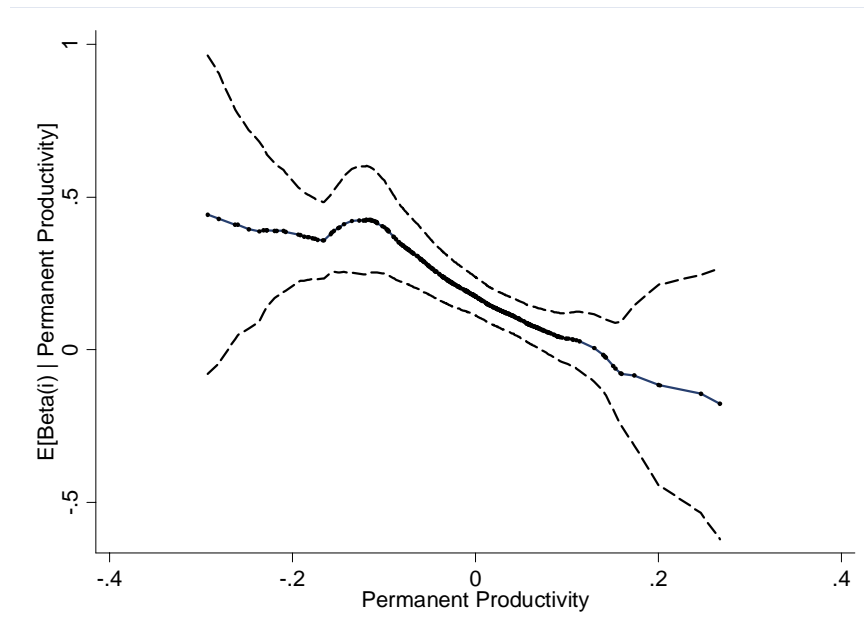
$$\Delta y_{itcs} = \beta \Delta \bar{\theta}_{-ist} + \gamma_{tds} + \psi \Delta X_{tcs} + e_{itcs}$$

# Individual-specific Spillover

- Our longitudinal data allow for models with an individual-specific spillover effect,  $\beta_i$ :

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

The relationship between individual permanent productivity and worker specific spillover effect

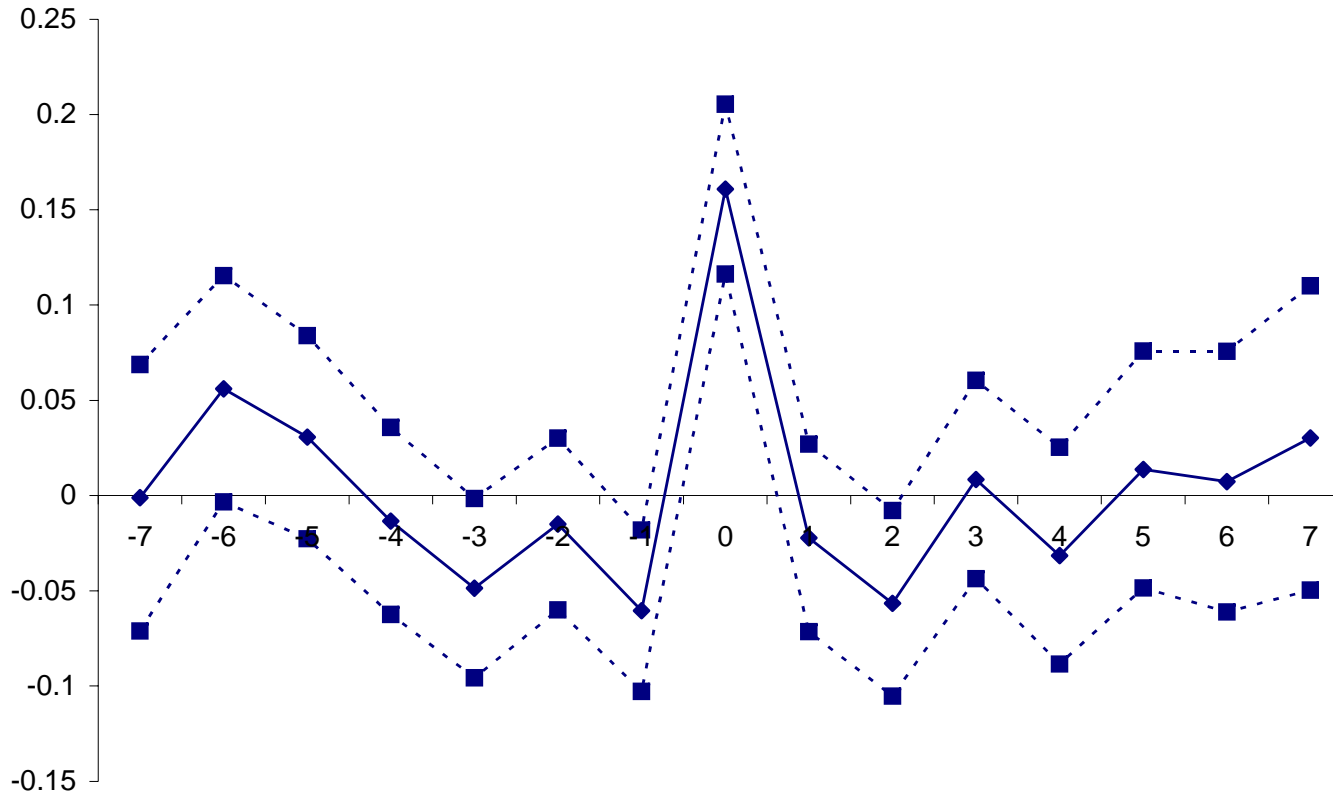


## What Determines Variation in Co-Workers Quality?

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- 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?

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- 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

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- Most of the peer effect operates through changes in workers that are able to monitor other workers
- As more productive workers are introduced into a shift, they influence only the co-workers that can be monitored. There is no effect on co-workers that can not be monitored.
- This finding is consistent with social pressure

## Finding 3

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- 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)
$\Delta$ Co-worker permanent productivity behind	0.233 (0.019)	
$\Delta$ Co-worker permanent productivity in front	0.007 (0.018)	
$\Delta$ Co-worker permanent productivity behind & closer		0.162 (0.016)
$\Delta$ Co-worker permanent productivity in front & closer		0.016 (0.015)
$\Delta$ Co-worker permanent productivity behind & farther		0.100 (0.018)
$\Delta$ Co-worker permanent productivity in front & farther		0.003 (0.018)



## Previous scheduling overlap

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- If social pressure is the explanation, the spillover effect between two workers should also vary as a function of the amount of interactions
- If a worker does not overlap often with somebody on a given shift, she may not be as receptive to social pressure because there is not much of a repeated component to the social interaction.
- It is more difficult to exert social pressure on individuals that we meet rarely than individuals that we see every day.

## Frequency of Interactions

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- Suppose a shift has checkers A, B, and C. We calculate the percent of A's 10 minute intervals that have overlapped with B and C up to the time of the current shift. We do this for all checkers and all shifts.
- We then compute the average permanent productivity for checkers that are between 0% and 5% overlap, 5% and 20% overlap, and 20% to 100% overlap.

## Previous scheduling overlap

	(1)
(I) $\Delta$ Co-worker permanent prod: low exposure	0.013 (0.012)
(II) $\Delta$ Co-worker permanent prod: medium exposure	0.084 (0.014)
(III) $\Delta$ Co-worker permanent prod: high exposure	0.075 (0.017)
p-value: Ho: (I) = (II)	0.000
Ho: (I) = (III)	0.003
Ho: (II) = (III)	0.655
Observations	1,659,450

# Conclusion

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- The theoretical effect of a change in the mix of co-workers can be either positive (peer effects) or negative (free riding).
  
- FINDING 1
  - the net effect is on average positive
  
- FINDING 2
  - There is substantial heterogeneity in this effect.
  - Low productivity workers benefit from the spillover substantially more than high productivity workers.

# Conclusions

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- FINDING 3

- Social pressure enforced by monitoring explains these peer effects
- When more productive workers arrive into shifts, they induce a productivity increase only in workers that are in their line-of-vision.
- The effect appears to decline with distance between registers

- FINDING 4

- Optimally choosing the worker mix can lower the firm's wage bill by about \$2.5 million per year
- This does not imply that the firm is not profit maximizing

### 3 Persuasion

- **Social Pressure:** Presence of public exerts pressure to take an action
- **Persuasion:** One person (or source) attempts to convince with words/images to take an action
- Social Pressure and Persuasion: Change in opinion/action beyond prediction of Bayesian model
- (Hard to do since Bayesian model very flexible)
- Non-rational Persuasion can occur for variety of reasons

- Non-Bayesian updating
- Effect of Emotions (Advertisement)
- Neglect of incentives of person presenting information

- **Cain, Loewenstein, and Moore (2005).** Psychology Experiment
  - Pay subjects for precision of estimates of number of coins in a jar
  - Have to rely on the advice of second group of subjects: advisors
  - (Advisors inspect jar from close)
  - Two experimental treatments:
    - \* *Aligned incentives.* Advisors paid for closeness of subjects' guess
    - \* *Mis-Aligned incentives.* Advisors paid for how high the subjects' guess is. Incentive common-knowledge
- Results: Estimate of the subjects is higher in Treatment with *Mis-Aligned incentives.*



- **Malmendier and Shantikumar (forthcoming).**
- Field evidence that small investors suffer from similar bias
- Small investor takes analyst recommendations literally
- However:
  - Upward distortion in recommendations (Buy=Sell, Hold=Sell, etc)
  - Higher distortion for analysts affiliated with an investment bank
- Analyze Trade Imbalance (essentially, whether trade is initiated by Buyer)

All Recommendations

	Large Trade	Small Trade	Difference S-L
Strong Sell	-0.103 (0.040)	-0.105 (0.050)	-0.002 (0.064)
Sell	-0.118 (0.034)	-0.139 (0.046)	-0.021 (0.057)
Hold	-0.091 (0.011)	0.007 (0.014)	0.099 (0.018)
Buy	0.011 (0.012)	0.134 (0.013)	0.123 (0.017)
Strong Buy	0.112 (0.013)	0.243 (0.014)	0.131 (0.019)
(Strong Sell)*Affiliation	-0.196 (0.255)	-0.838 (0.331)	-0.643 (0.418)
(Sell)*Affiliation	0.094 (0.254)	-0.087 (0.272)	-0.180 (0.372)
(Hold)*Affiliation	-0.001 (0.044)	0.005 (0.056)	0.006 (0.072)
(Buy)*Affiliation	-0.068 (0.034)	0.013 (0.039)	0.081 (0.052)
(Strong Buy)*Affiliation	-0.129 (0.036)	-0.023 (0.041)	0.106 (0.055)
Sample size	86,961	86,961	
R <sup>2</sup>	0.0034	0.0085	

- Strong evidence of distortion

- **DellaVigna and Kaplan (2006)**

- Study entry of new, more conservative media: Fox News

- If people underestimate incentives of media to give conservative slant →  
Persuasion to change voting behavior

- Competing hypotheses:

- Filtering of Bias

- Fox News has real information

# 1 Introduction

- Surveys: 70 percent of people believe there is a great deal or a fair amount of "political bias in news coverage" (Pew, 2000)
- BUT: Does media bias *matter*?
- Are people persuaded by the media – or is it all sorting into favorite media?  
*Effect on voting*
- Given sorting: What is effect on the already convinced?  
*Effect on campaign contributions for Republican Party (preliminary)*
- Policy: Regulation of media markets (FCC)

Which of the following statements best describes you:  
A. The president is always right.  
B. The president is never wrong.  
C. I don't watch Fox News Channel.

ACME POLLING SERVICES



- Scenario 1:

1. Sophistication. Invert media bias (Gentzkow and Shapiro, 2005)
2. Sorting. Listen to media confirming priors
  - Media bias has no effect on behavior

- Scenario 2:

1. Credulous audience (Cain, Loewenstein, and Moore, 2005) and small investors (Malmendier and Shantikumar, 2005)
2. Persuasion bias (De Marzo et al., 2003)
  - Media bias has systematic effect on behavior

- Fox News natural experiment

1. Fast expansion of Fox News in cable markets

- October 1996: Launch of 24-hour cable channel
- June 2000: 17 percent of US population listens regularly to Fox News (Scarborough Research, 2000)

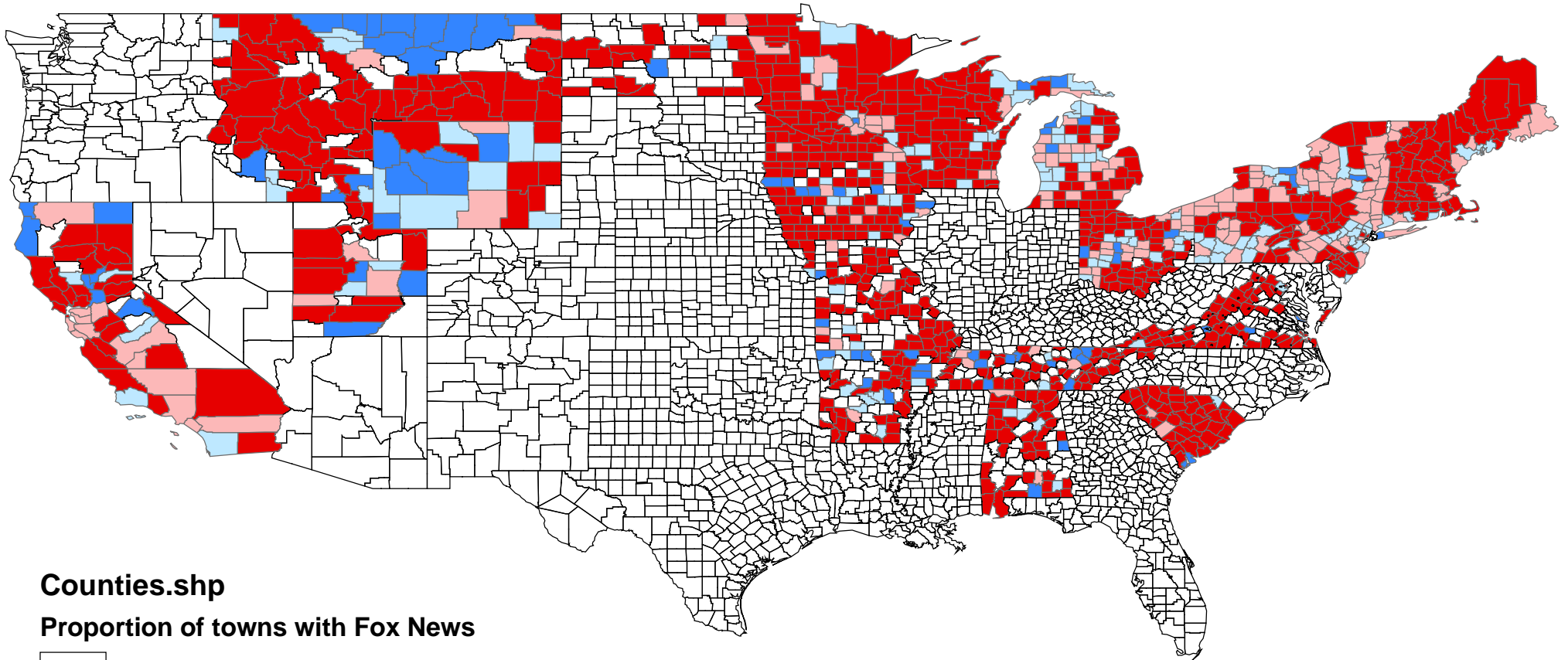
2. Geographical differentiation in expansion

- Cable markets: Town-level variation in exposure to Fox News
- 9,256 towns with variation even within a county

3. Conservative content






- Unique right-wing TV channel (Groseclose and Milyo, 2004)

**Figure 1. Fox News Availability by County, 2000.**



**Counties.shp**

**Proportion of towns with Fox News**

-  No Data
-  proportion = 0
-   $0 < \text{proportion} < 0.5$
-   $0.5 \leq \text{proportion} < 1$
-  proportion = 1

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. Alaska and Hawaii are also in the data set, but are not included on the map due to space constraints.



- Strategy:

- Compare towns that offer Fox News in 2000 to towns that do not
- Analyze effect on changes in town-level voting

- Results:

- .4-.7 percentage point effect on Republican vote share in Pres. elections
- Similar effect on Senate elections (and mostly on turnout)
- Evidence of impact on campaign contributions for Republicans
- No evidence of impact on military recruitment (noisy)

## 2 Model

- Setting

1. **New media source** with unknown bias  $\beta$ , with  $\beta \sim N\left(\beta_0, \frac{1}{\gamma_\beta}\right)$
2. Media observes (differential) quality of Republican politician,  $\theta_t \sim N\left(0, \frac{1}{\gamma_\theta}\right)$ , i.i.d., in periods  $1, 2, \dots, T$
3. **Media broadcast:**  $\psi_t = \theta_t + \beta$ . Positive  $\beta$  implies pro-Republican media bias
4. **Voting in period  $T$ .** Voters vote Republican if  $\hat{\theta}_T + \alpha > 0$ , with  $\alpha$  ideological preference

- Signal extraction problem. New media (Fox News) says Republican politician (George W. Bush) is great
  - Is Bush great?
  - Or is Fox News pro-Republican?
- A bit of both, the audience thinks. Updated media bias after  $T$  periods:

$$\hat{\beta}_T = \frac{\gamma_\beta \beta_0 + T\gamma_\theta \bar{\psi}_T}{\gamma_\beta + T\gamma_\theta}.$$

- Estimated quality of Republican politician:

$$\hat{\theta}_T = \frac{\gamma_\theta * 0 + W [\psi_T - \hat{\beta}_T]}{\gamma_\theta + W} = \frac{W [\psi_T - \hat{\beta}_T]}{\gamma_\theta + W}$$

- **Persuasion.** Voter with persuasion  $\lambda$  ( $0 \leq \lambda \leq 1$ ) does not take into account enough media bias:

$$\hat{\theta}_T^\lambda = \frac{W^\lambda[\psi_T - (1 - \lambda)\hat{\beta}_T]}{\gamma_\theta + W^\lambda}$$

- Vote share for Republican candidate.  $P(\alpha + \hat{\theta}_T^\lambda \geq 0) = 1 - F(-\hat{\theta}_T^\lambda)$

- **Proposition 1.** Three results:

1. **Short-Run I:** *Republican media bias increases Republican vote share:*  
 $\partial[1 - F(-\hat{\theta}_T^\lambda)]/\partial\beta > 0$ .
2. **Short-Run II:** *Media bias effect higher if persuasion ( $\lambda > 0$ ).*
3. **Long-run** ( $T \rightarrow \infty$ ). *Media bias effect  $\iff$  persuasion  $\lambda > 0$ .*

- Intuition.

- Fox News enthusiastic of Bush
- Audience updates beliefs: “This Bush must be really good” (**Short-Run I**)
- Believe media more if credulous or persuadable (**Short-Run II**)
- But: Fox News enthusiastic also of Karl Rove, Rick Lazio, Bill Frist  
—> “They cannot be all good!”
- Make inference that Fox News is biased, stop believing it
- Fox News influences only individuals subject to persuasion (**Long-Run**)

### 3 Data

- **Cable data for year 2000.** Source: *Television and Cable Factbook, 2001*
- **Election data.**
  - Sources: Federal Elections Project (2000), Record of American Democracy (1988), Atlas Election data (1992-96, 2004), State Election Offices (1992-96)
  - Town-level data for 1996 and 2000
- Sample: 9,256 towns, 28 US States, 1,166 counties

- **Campaign contribution data.**

- Source: FEC. All contributions above \$200
- Contributions in 1996 election cycle and 2000 election cycle

- **Military recruitment data.**

- Source: DOD. All Applications for all branches of the military
- Data for 1996 and 2000

- Aggregate both data at town level as count variables

## 4 Empirical Results

- **Selection.** In which towns does Fox News select? (Table 3):

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

- Controls  $X$ :
  - Census + Cable controls (Number of channels and potential subscribers)
  - US House district or county fixed effects
- Conditional on  $X$ , Fox News availability is orthogonal to political variables, campaign contr., and military enlistments



**Table 3. Determinants of Fox News Availability, Linear Probability Model**

Dep. Var.:	Availability of Fox News Via Cable in 2000						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Pres. Republican Vote Share in 1996</b>	0.1436 (0.1549)	0.6363 (0.2101)***	0.3902 (0.1566)**	-0.0343 (0.0937)	-0.0442 (0.1024)	0.0902 (0.1321)	0.0627 (0.1333)
<b>Pres. Log Turnout in 1996</b>	0.1101 (0.0557)**	0.0909 (0.0348)***	0.0656 (0.0278)**	0.0139 (0.0124)	-0.0053 (0.0173)	0.0286 (0.0234)	0.0257 (0.0258)
<b>Pres. Rep. Vote Share Change 1988-1992</b>						0.214 (0.2481)	-0.2548 (0.2345)
<b>Control Variables:</b>							
<b>Census Controls: 1990 and 2000</b>		X	X	X	X	X	X
<b>Cable System Controls</b>			X	X	X	X	X
<b>US House District Fixed Effects</b>				X		X	
<b>County Fixed Effects</b>					X		X
<b>F-Test: Census Controls = 0</b>		F=3.54***	F=2.73***	F=1.11	F=1.28	F=1.57**	F=1.31
<b>F-Test: Cable Controls = 0</b>			F=18.08***	F=21.09***	F=18.61***	F=8.19***	F=8.75***
<b>R<sup>2</sup></b>	0.0283	0.0901	0.4095	0.6691	0.7673	0.6321	0.7615
<b>N</b>	N = 9256	N = 9256	N = 9256	N = 9256	N = 9256	N = 3722	N = 3722

**Notes:** An observation in the linear probability model is a town in one of the 28 US States in the sample. The dependent variable is a binary variables that equal one if Fox News was part of the town's local cable package in 2000. The log turnout measure is the log of the ratio of total votes cast in 1996 to voting-age population in the town in 1996. The population data for 1996 is interpolated from the 1990 and 2000 Census. The Census Controls are 12 demographic variables from the Census, present both in the 2000 values and in differences between 2000 and 1990. The Cable System Controls are deciles in the number of channels provided and in the number of potential subscribers. All controls are listed in Appendix Table 1. The F-Test is a joint test of the hypothesis that the Census controls from 1990 and 2000 (respectively, the Cable Controls) are jointly equal to zero. Robust standard errors clustered by local cable company in parentheses. The observations are weighted by total votes cast in 1996

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

**Table 3b. Determinants of Fox News Availability, FEC and DOD Data**

Dep. Var.:	Availability of Fox News Via Cable in 2000							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Campaign. Contr. To Republicans 1996 (Share)</b>	-0.0114 (0.0114)	-0.0206 (0.0125)*						
<b>Campaign. Contr. To Republicans 1992-1996 (Share)</b>			0.0054 (0.0172)	0.0027 (0.0166)				
<b>Military Applications in 1996 (Share)</b>					-0.0061 (0.0114)	-0.0124 (0.0113)		
<b>Military Applications 1992-1996 (Share)</b>							-0.0008 (0.0166)	0.0228 (0.0171)
<b>Control Variables:</b>								
<b>Census Controls: 1990+2000</b>	X	X	X	X	X	X	X	X
<b>Cable System Controls</b>	X	X	X	X	X	X	X	X
<b>US House District F.E.</b>	X		X		X		X	
<b>County Fixed Effects</b>		X		X		X		X
<b>N</b>	N = 14340	N = 14298	N = 14340	N = 14298	N = 14340	N = 14298	N = 14340	N = 14298

**Notes:** An observation in the linear probability model is a town in one of the 28 US States in the sample. The dependent variable is a binary variables that equal one if Fox News was part of the town's local cable package in 2000. The log turnout measure is the log of the ratio of total votes cast in 1996 to voting-age population in the town in 1996. The population data for 1996 is interpolated from the 1990 and 2000 Census. The Census Controls are 12 demographic variables from the Census, present both in the 2000 values and in differences between 2000 and 1990. The Cable System Controls are deciles in the number of channels provided and in the number of potential subscribers. All controls are listed in Appendix Table 1. The F-Test is a joint test of the hypothesis that the Census controls from 1990 and 2000 (respectively, the Cable Controls) are jointly equal to zero. Robust standard errors clustered by local cable company in parentheses. The observations are weighted by total votes cast in 1996 presidential election.

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

	Fox Town	No-Fox Town
1996	0	0
2000	FOX	0

- **Difference-in-Difference Estimation**

1. Simplest comparison (Single Difference):  $v_{2000}^{FOX} - v_{2000}^{NO}$

2. Control for previous voting (Difference-in-Difference):

$$\left( v_{2000}^{FOX} - v_{2000}^{NO} \right) - \left( v_{1996}^{FOX} - v_{1996}^{NO} \right) \text{ or}$$

$$v_{2000} - v_{1996} = \alpha + \beta_F d_{2000}^{FOX} + \varepsilon$$

3. Control for previous voting and other controls:

$$v_{2000} - v_{1996} = \alpha + \beta_F d_{2000}^{FOX} + \Gamma X + \varepsilon$$

- **Baseline effect – Presidential races**

- *Effect on Presidential Republican vote share (Table 4):*

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

- Results:

- Significant effect of Fox News with district (Column 3) and county fixed effects (Column 4)
- Robustness (Table 5 and Appendix Table 2)
- Timing of effects (Table 7)

**Table 4. The Effect of Fox News on the 2000-1996 Presidential Vote Share Change**

Dep. Var.:	Republican Two-Party Vote Share Change between 2000 & 1996 Pres. Elections						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Availability of Fox News Via Cable in 2000	-0.0025 (0.0037)	0.0027 (0.0024)	0.008 (0.0026)***	0.0042 (0.0015)***	0.0069 (0.0014)***	0.0037 (0.0021)*	0.0048 (0.0019)**
Pres. Rep. Vote Share Change 1988-1992						0.0229 (0.0216)	0.0514 (0.0219)**
Constant	0.0347 (0.0017)***	-0.028 (0.0245)	-0.0255 (0.0236)	0.0116 (0.0154)	0.0253 (0.0185)	-0.0377 (0.0258)	0.0081 (0.0313)
<b>Control Variables:</b>							
Census Controls: 1990 and 2000		X	X	X	X	X	X
Cable System Controls			X	X	X	X	X
US House District Fixed Effects				X		X	
County Fixed Effects					X		X
R <sup>2</sup>	0.0007	0.5207	0.5573	0.7533	0.8119	0.7528	0.8244
N	N = 9256	N = 9256	N = 9256	N = 9256	N = 9256	N = 3722	N = 3722

**Notes:** An observation in the OLS regression is a town in one of the 28 US States in the sample. The dependent variable is the two-party republican vote share for the 2000 presidential election minus the two-party republican vote share for the 1996 presidential election. The variable "Availability of Fox News via Cable in 2000" is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. The Census Controls are 12 demographic variables from the Census, present both in the 2000 values and in differences between 2000 and 1990. The Cable System Controls are deciles in the number of channels provided and in the number of potential subscribers. All controls are listed in Appendix Table 1. Robust standard errors clustered by local cable company in parentheses. The observations are weighted by total votes cast in the 1996 presidential election.

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

- Other main effects:
  - **Senate.** Fox News affected Senate race, despite not covering them
    - > Evidence of an Ideological Effect
  - **Turnout.** Effect on voter turnout
    - > Part of impact is convincing additional Republicans to vote
  - **Heterogeneity.** Effect is largest in
    - \* more Democratic areas –> Turn-out of closet Republicans
    - \* areas with fewer cable channels –> Competition moderates the effect

**Table 7. Timing of Fox News Effect on Presidential Vote Share Change**

Dep. Var.:	Pres. Rep. Vote Share '00-'96				Pres. Rep. Vote Share '04-'00		Pres. Rep. Vote Share '96-'92	
	(1)	(2)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Fox News 2000</b>	0.0034 (0.0021)*	0.0072 (0.0018)***	0.0034 (0.0021)	0.0061 (0.0018)***	0.0021 (0.0020)	0.0015 (0.0023)	-0.0022 (0.0031)	-0.0005 (0.0035)
<b>Fox News 1998</b>	-0.0008 (0.0023)	-0.0032 (0.0020)						
<b>Control Variables:</b>								
<b>Census 2000 and 1990</b>	X	X	X	X	X	X	X	X
<b>Cable System Controls</b>	X	X	X	X	X	X	X	X
<b>House Distr. Fixed Effects</b>	X		X		X	X	X	X
<b>County Fixed Effects</b>		X		X				
<b>Fox News 2004 = 1</b>			X	X		X		X
<b>Optimally Trimmed Sample</b>						X		X
<b>R<sup>2</sup></b>	0.76	0.8099	0.7792	0.8395	0.6289	0.6703	0.6187	0.688
<b>N</b>	N = 6672	N = 6672	N = 4844	N = 4844	N = 8605	N = 3886	N = 4006	N = 1706

**Notes:** : An observation in the OLS regression is a town in one of the 28 US States in the sample. In columns (1)-(6), the dependent variable is the Republican vote share for the 2000 presidential election minus the same variables for the 1996 elections. In columns (7)-(8), the dependent variable is the Republican vote share for the 2004 presidential election minus the same variables for the 2000 elections. In columns (9)-(10), the dependent variable is the Republican vote share for the 1996 presidential election minus the same variables for the 1992 elections. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. Fox News 1998 is similarly defined. In Columns (5) and (6) the sample is restricted to towns which have Fox News available by 2004. Robust standard errors clustered by local cable company in parentheses. The observation are weighted by total votes cast in the 1996 presidential elections.

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

**Table 8. The Effect of Fox News on the 2000 Senatorial Races**

	Dep. Var.: Rep. Vote Share 2000 Senate - 1996 Pres. Elect.						Rep. Vote Share Change Senate 2000 minus 1994	
	Two-Party Vote Share						(8)	(9)
	(1)	(2)	(3)	(4)	(5)	(6)		
<b>Fox News 2000</b>	0.0079 (0.0026)***	0.0082 (0.0030)***	0.0033 (0.0029)	0.0045 (0.0038)		0.0105 (0.0038)***	0.0112 (0.0049)**	0.0138 (0.0056)**
<b>Fox News * (New York Race)</b>	0.0011 (0.0063)	-0.0054 (0.0074)	0.014 (0.0071)**	0.0029 (0.0060)		-0.0009 (0.0063)	.	.
<b>Subscription Ratio to Fox News</b>					0.0195 (0.0054)***			
<b>(Subscription Ratio to Fox News) * (New York Race)</b>					0.0108 (0.0141)			
<b>Fox * (.453 &lt; Average 1996 Rep. Vote Share In District &lt; .513)</b>						-0.0014 (0.0046)		
<b>Fox * (Average 1996 Rep. Vote Share In District &gt; .513)</b>						-0.0114 (0.0065)*		
<b>Control Variables:</b>								
<b>Census 2000 and 1990</b>	X	X	X	X	X	X	X	X
<b>Cable System Controls</b>	X	X	X	X	X	X	X	X
<b>US House District Fixed Effects</b>	X		X		X	X	X	
<b>County Fixed Effects</b>		X		X				X
<b>Optimally Trimmed Sample</b>			X	X				
<b>R<sup>2</sup></b>	0.9288	0.948	0.9275	0.9468	0.9289	0.9289	0.7484	0.8361
<b>N</b>	N = 8192	N = 8192	N = 3877	N = 3877	N = 8150	N = 8192	N = 2037	N = 2037



**Table 9. The Effect of Fox News on the 2000-1996 Turnout Change**

Dep. Var.: Turnout Change between the 2000 & 1996 Presidential Elections								
	Log Total Votes Cast						Total Votes Cast as Share of Pop. 18+	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Fox News 2000</b>	0.0064 (0.0043)	0.0185 (0.0056)***	0.0085 (0.0046)*	0.0144 (0.0065)**		0.0195 (0.0069)***	-0.0014 (0.0018)	0.0032 (0.0022)
<b>Share of Pop. Subscribing to Fox News Cable</b>					0.0154 (0.0088)*			
<b>Fox * (.453 &lt; Av. 1996 Rep. Vote Share In District &lt;</b>						-0.0261 (0.0089)***		
<b>Fox * (Average 1996 Rep. Vote Share In District &gt;</b>						-0.0171 (0.0104)		
<b>Control Variables:</b>								
<b>Census 2000 and 1990</b>	X	X	X	X	X	X	X	X
<b>Cable System Controls</b>	X	X	X	X	X	X	X	X
<b>House District Fixed Effects</b>	X		X		X	X	X	
<b>County Fixed Effects</b>		X		X				X
<b>Optimally Trimmed Sample</b>			X	X				
<b>R<sup>2</sup></b>	0.6029	0.6735	0.6568	0.7153	0.6037	0.6041	0.6152	0.6913
<b>N</b>	N = 9256	N = 9256	N = 4177	N = 4177	N = 9214	N = 9256	N = 8455	N = 8455

**Notes:** An observation in the OLS regression is a town in one of the 28 US States in the sample. For columns (1)-(6), the dependent variable is the log of total votes cast in the 2000 Presidential elections minus the same variable in 1996. For columns (7)-(8), the dependent variable is the share of total votes cast in the 2000 presidential election over the 2000 population over 18, minus the same measure in 1996. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. Robust standard errors clustered by cable affiliate in parentheses. The observation are weighted by total votes cast in the 1996 presidential elections.

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

- Unanswered questions – Follow-up paper with Dan Acland (UC Berkeley)
  1. Effect of Fox News on the largest share of its audience, the committed Republicans → Campaign Contributions
  2. Effect on non-political decisions → Military Recruitment
  
- Count variable  $c_{k,t}$ :
  - $Contr_{k,t}^R$ : # contributions for Rep. in town  $k$  and election  $t$
  - $Contr_{k,t}^D$ : # contributions for Dem. in town  $k$  and election  $t$
  - $Mil_{k,t}$ : # Military Applications in town  $k$  and year  $t$

- Specification: Fixed Effect Poisson Regressions

$$c_{kt} \sim \text{Poisson}(\mu_{kt} = \alpha_k \exp(X_{kt}\Gamma + \beta_F d_t^{FOX})) \quad t = 1996, 2000$$

- This implies

$$E[c_{kt}|X_{kt}, \alpha_k] = \exp(\ln \alpha_k + X_{kt}\Gamma + \beta_F d_t^{FOX})$$

- $\beta_j$  is the proportional change in  $c_{kt}$  for one-unit change in  $x_j$ :

$$\beta_j = \frac{\delta E[c|x]}{\delta x_j} \frac{1}{E[c|x]}$$

- Drawback: Standard errors not clustered

- Preliminary results:
- **Contributions to Republicans.**
  - Estimated 3 percent impact of Fox News
  - Large compared to 1 percent impact on voting
  - Too large? At-risk population is much more likely to be in Fox audience
- **Contributions to Democrats.** Estimated no effect
- **Military recruitment.** Estimated no effect

**Table 4b. The Effect of Fox News on Campaign Contributions and Military Applications**

Specification:	Fixed Effect Poisson Regressions for Years t = 1996 and t = 2000					
	# Contributions to Rep. in Town k and Year t		# Contributions to Dem. in Town k and Year t		Military Applications in Town k and Year t	
Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
Availability of Fox News Via Cable in 2000	0.0312 (0.0118)***	0.0306 (0.0152)**	-0.017 (0.0176)	0.0263 (0.0231)	-0.0082 (0.0111)	-0.0064 (0.0137)
<b>Control Variables:</b>						
Town Fixed Effects	X	X	X	X	X	X
Census Controls: 1990 and 2000 (Interacted with Year=2000)	X	X	X	X	X	X
Cable System Controls (Interacted with Year=2000)	X	X	X	X	X	X
US House District Fixed Effects (Interacted with Year=2000)	X	X	X	X	X	X
Optimally Trimmed Sample		X		X		X
<b>N</b>	N = 17424	N = 7858	N = 13502	N = 6386	N = 20216	N = 8364

**Notes:** An observation in the Poisson Fixed-Effect regression is a town-year combination. The regressions include two observations for each town (t=1996 and t=2000) and a town fixed effect. The dependent variable is indicated in the Table. The variable "Availability of Fox News via Cable in 2000" is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. The Census Controls are 12 demographic variables from the Census, present both in the 2000 values and in differences between 2000 and 1990. The Cable System Controls are deciles in the number of channels provided and in the number of potential subscribers.

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

- **Magnitude of effects**

- Estimates for  $\hat{\beta}_F$ : .40 percentage points (within congressional district), .69 percentage points (within county)
- Compare to standard deviation vote share change '96-'00: 5.40 pctg. pts.
- Overall effect on 2000 elections
  - Fox News available for 34 percent of population
  - Total effect:  $.34 * .0054 * (105m) \approx 200,000$  votes.
- In Florida:  $.33 * .0054 * (5,963,110) = 10,626$  votes ( $> 537!$ )

## 5 Interpretation

- Estimate exposure to Fox News in towns that have Fox News via cable
- Scarborough data with Zip code of respondent
  - Audience measures:
    1. *Recall* measure. "Did you listen to... last week" (35.3 CNN, 16.6 Fox News)
    2. *Diary* measure. Record all 30 minutes of TV for a week (10.3 CNN, 3.5 Fox News)

- Result: Fox News exposure via cable increases regular audience by 6 to 10 percentage points
- How many people did Fox News convince?
- Heuristic answer: Divide effect on voting (.4-.6 percentage point) by audience measure (.6 to .10)
- Result: Fox News convinced 3 to 8 percent of audience (Recall measure) or 11 to 28 percent (Diary measure)



- Interpretations:

### 1. **Endogeneity Bias**

- Fox News enters towns that were becoming more Republican (Profit Max!)
- BUT: No differences in Republican vote share in 1996

### 2. **Rational Learning**

- Learning about bias of Fox News
- Possible short-term effect of Fox News on beliefs
- BUT: Political orientation quite clear

### 3. Persuasion

- Underestimate incentives of media (Cain, Loewenstein, Moore, 2005)
  - Voters double-count information (De Marzo, Vayanos, Zwiebel, 2004)
  - Effect of exposure to new media
- 
- Different policy implications:
    - Rational voters: Effect is temporary, media ownership not key
    - Persuasion-prone voters: Permanent effect , media ownership counts

**Table 11. Comparison with Persuasion Rates in Other Media Studies**

Paper	Treatment	Elect. Type or Question	Variable $t$	Control Group $t_T$	Treatm. Group $t_C$	Exp. Rate $e_T - e_C$	Pers. Rate $f$
	(1)	(2)		(6)	(7)	(8)	(9)
<b><u>Fox News Study</u></b>							
<b>DellaVigna and Kaplan (2005)</b>	Fox News Exposure, County f.e.	Presidential Election	Republican Vote Share	0.556	0.560	0.121	0.033
	Fox News Exposure, Distr. f.e.	Election	Vote Share	0.556	0.563	0.079	0.083
<b><u>Turn-Out-The-Vote Experiments</u></b>							
<b>Gerber and Green (2000)</b>	Door-to-Door Canvassing	Federal Elect.	Turnout	0.422	0.463	0.270	0.263
	Canvassing + Mail + Calls	Federal Elect.	Turnout	0.422	0.448	0.270	0.167
<b>Green, Gerber, and Nickerson (2003)</b>	Door-to-Door Canvassing	Local Elect.	Turnout	0.286	0.310	0.293	0.118
<b>Green and Gerber (2001)</b>	Phone Calls By Youth Vote	General Elect.	Turnout	0.660	0.711	0.737	0.205
	Phone Calls 18-30 Year-Olds	General Elect.	Turnout	0.405	0.416	0.414	0.045
<b><u>Laboratory Experiments</u></b>							
<b>Ansolabehere and Iyengar (1995)</b>	Laboratory Exposure to 30-Second Political Ad	Governor Elect. Senate Elect. Mayor Elect.	Vote Share for Party Sponsoring Ad	0.530	0.568	1.000	0.082
<b><u>Surveys</u></b>							
<b>Kull et al. (2003)</b>	Respond. watches Fox News	Did US find WMD in Iraq?	Share of Yes Answers	0.220	0.330	1.000	0.141
<b>Gentzkow and Shapiro (2004)</b>	Respondent watches CNN	Did Arabs do 9/11 attack?	Share of Yes Answers	0.215	0.280	1.000	0.083
	Respond. watches Al Jazeera	9/11 attack?	Answers	0.215	0.133	1.000	0.105

## 7 Conclusion

- Does media bias affect political behavior?
- Impact of Fox News on Presid., Senate vote share, and turnout
- Persuasion rate of the media: 3-8 percent / 11-12 percent
- Work in progress:
  - Impact on Campaign Contributions to Republicans
  - No Impact on Military Recruitment

## 4 Next Lecture

- Non-Standard Beliefs
  - Overoptimism
  - Overconfidence
  - Projection Bias
- In Two weeks: Empirical Problem Set Handed Out