The turnout experiment

PSCI 2301: Quantitative Political Science II

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Recap — the big picture

What we want to know: Average treatment effect

- Difference in potential outcomes, $Y_{1i} - Y_{0i}$
- ...averaged across all units in population

Key condition for inference: Independence

- No correlation b/w potential outcomes and assignment to treatment
- Condition on the assignment mechanism, not the causal effects

If independence holds:

$$\underbrace{\mathbf{avg}[Y_i \mid D_i = 1] - \mathbf{avg}[Y_i \mid D_i = 0]}_{\text{observed diff in means}} \approx \underbrace{\mathbb{E}[Y_{1i} - Y_{0i}]}_{\text{avg treatment effect}}$$

Recap — last class

Randomized experiments as a path to causal inference

1. Essentials of experimental design
    - *Ex ante* prob of treatment should be same for all units
    - Ideal is for treatment and control to be representative of full sample
2. Randomization and independence
    - Equal assignment probability $\rightsquigarrow$ no correlation of potential outcomes and treatment assignment in population
    - Randomization failure possible in any given sample, but unlikely in large sample

Today's agenda

1. Going deeper on the Gerber, Green, Larimer experiment
    - How they tailor treatments to address specific questions
    - Downloading their data + analyzing it ourselves
2. Limitations of the experimental approach
    - External validity concerns
    - Ethical concerns

Defining treatment and comparisons

The research question

Gerber, Green, Larimer 2008 (GGL): How does social pressure affect turnout?

What's manipulable here?

- Whether someone feels social pressure $\rightsquigarrow$ not manipulable
- Explicit exposure to social pressure $\rightsquigarrow$ plausibly manipulable

GGL's intervention: Induce exposure to social pressure via household mailer

GGL's treatment

The "Neighbors" condition

ECRLOT **C050
THE JACKSON FAMILY
9999 MAPLE DR
FLINT MI 48507

Dear Registered Voter:

WHAT IF YOUR NEIGHBORS KNEW WHETHER YOU VOTED?

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

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

DO YOUR CIVIC DUTY — VOTE!

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

Isolating extrinsic pressure

GGL want to know effect of **extrinsic** civic duty considerations

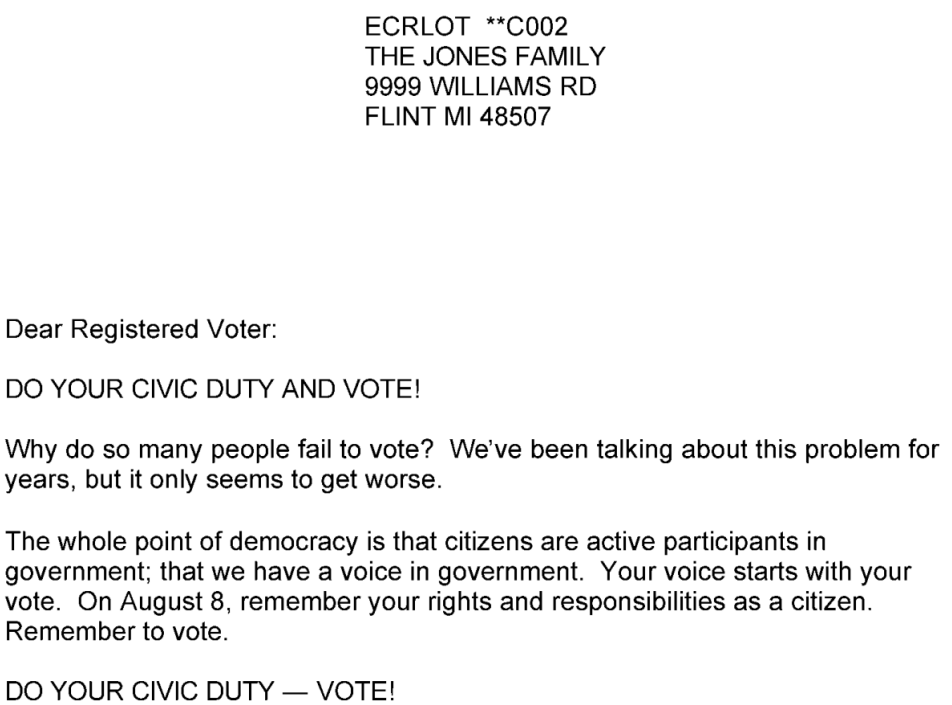
But their mailer is a “bundled treatment”, doing many things at once

- Activating extrinsic pressure to vote, as intended
- Activating intrinsic feelings of civic duty
- Letting subjects know they’re being studied — Hawthorne effect

Comparison to “no mailer” alone wouldn’t isolate extrinsic pressure effect

GGL's comparison groups

1. "Civic duty" condition



ECRLOT **C002
THE JONES FAMILY
9999 WILLIAMS RD
FLINT MI 48507

Dear Registered Voter:

DO YOUR CIVIC DUTY AND VOTE!

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

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

DO YOUR CIVIC DUTY — VOTE!

✅ Activate intrinsic civic duty

❌ Activate extrinsic pressure to vote

❌ Let subjects know they're being studied

GGL's comparison groups

2. "Hawthorne" condition

ECRLOT **C001
THE SMITH FAMILY
9999 PARK LANE
FLINT MI 48507

Dear Registered Voter:

YOU ARE BEING STUDIED!

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

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

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

DO YOUR CIVIC DUTY — VOTE!

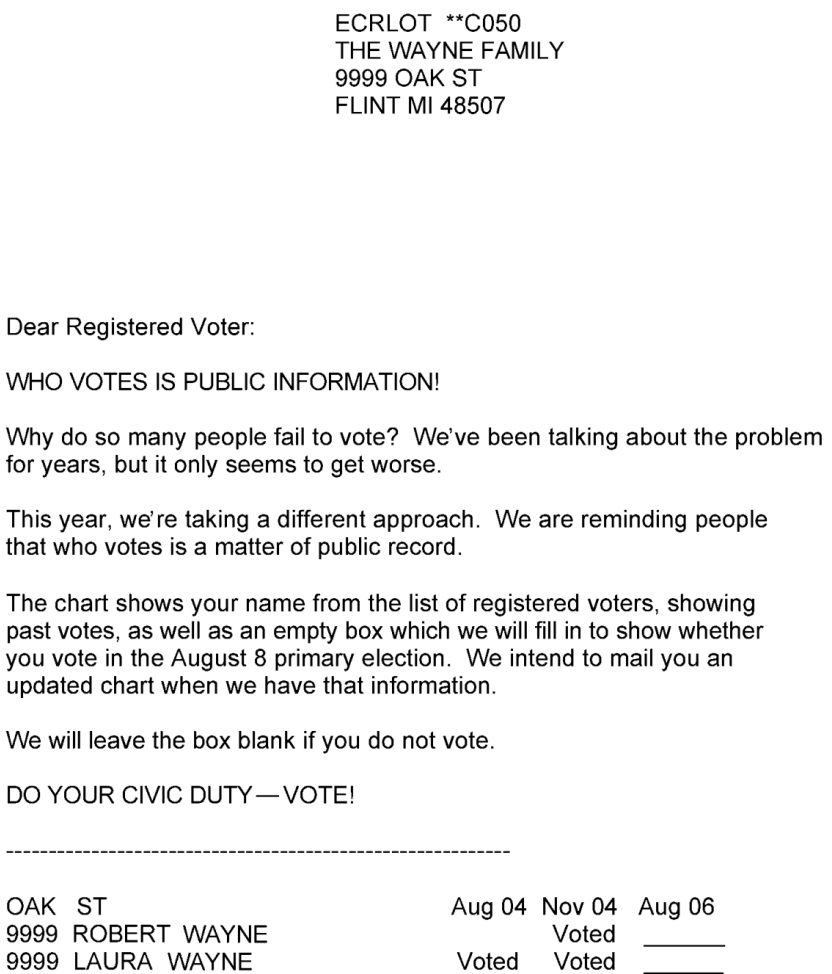
✅ Activate intrinsic civic duty

❌ Activate extrinsic pressure to vote

✅ Let subjects know they're being studied

GGL's comparison groups

3. "Self-treatment" condition



ECRLOT **C050
THE WAYNE FAMILY
9999 OAK ST
FLINT MI 48507

Dear Registered Voter:

WHO VOTES IS PUBLIC INFORMATION!

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

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

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

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

DO YOUR CIVIC DUTY—VOTE!

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

✅ Activate intrinsic civic duty

🤷‍♂️ Activate extrinsic pressure to vote

✅ Let subjects know they're being studied

GGL's comparison groups

4. "Control" condition

(no mailer)

❌ Activate intrinsic civic duty

❌ Activate extrinsic pressure to vote

❌ Let subjects know they're being studied

Making relevant comparisons

Which comparison is right? Depends on your research question

What's effect of strong social pressure vs no social pressure?

→ avg[vote | neighbors] - avg[vote | civic duty]

What's effect of strong social pressure vs weak social pressure?

→ avg[vote | neighbors] - avg[vote | self-treatment]

What's effect of knowing you're being studied?

→ avg[vote | Hawthorne] - avg[vote | civic duty]

How cost-effective is {mailer} for get-out-the-vote?

→ avg[vote | {mailer}] - avg[vote | control]

Analyzing the data

Getting the data

Posted online at Yale's institutional data repository

```
df_ggl <- read_csv("http://hdl.handle.net/10079/d3669799-4537-411e-b175-d9e837324c35")
print(df_ggl)
```

```
# A tibble: 344,084 × 16
  sex      yob g2000 g2002 g2004 p2000 p2002 p2004 treatment cluster voted hh_id
  <chr>  <dbl> <chr> <chr> <chr> <chr> <chr> <chr> <chr>       <dbl> <chr> <dbl>
1 male    1941 yes   yes   yes   no    yes   No    Civic Du...       1 No        1
2 female  1947 yes   yes   yes   no    yes   No    Civic Du...       1 No        1
3 male    1951 yes   yes   yes   no    yes   No    Hawthorne         1 Yes       2
4 female  1950 yes   yes   yes   no    yes   No    Hawthorne         1 Yes       2
5 female  1982 yes   yes   yes   no    yes   No    Hawthorne         1 Yes       2
# i 344,079 more rows
# i 4 more variables: hh_size <dbl>, numberofnames <dbl>, p2004_mean <dbl>,
#   g2004_mean <dbl>
```

Distribution of treatments

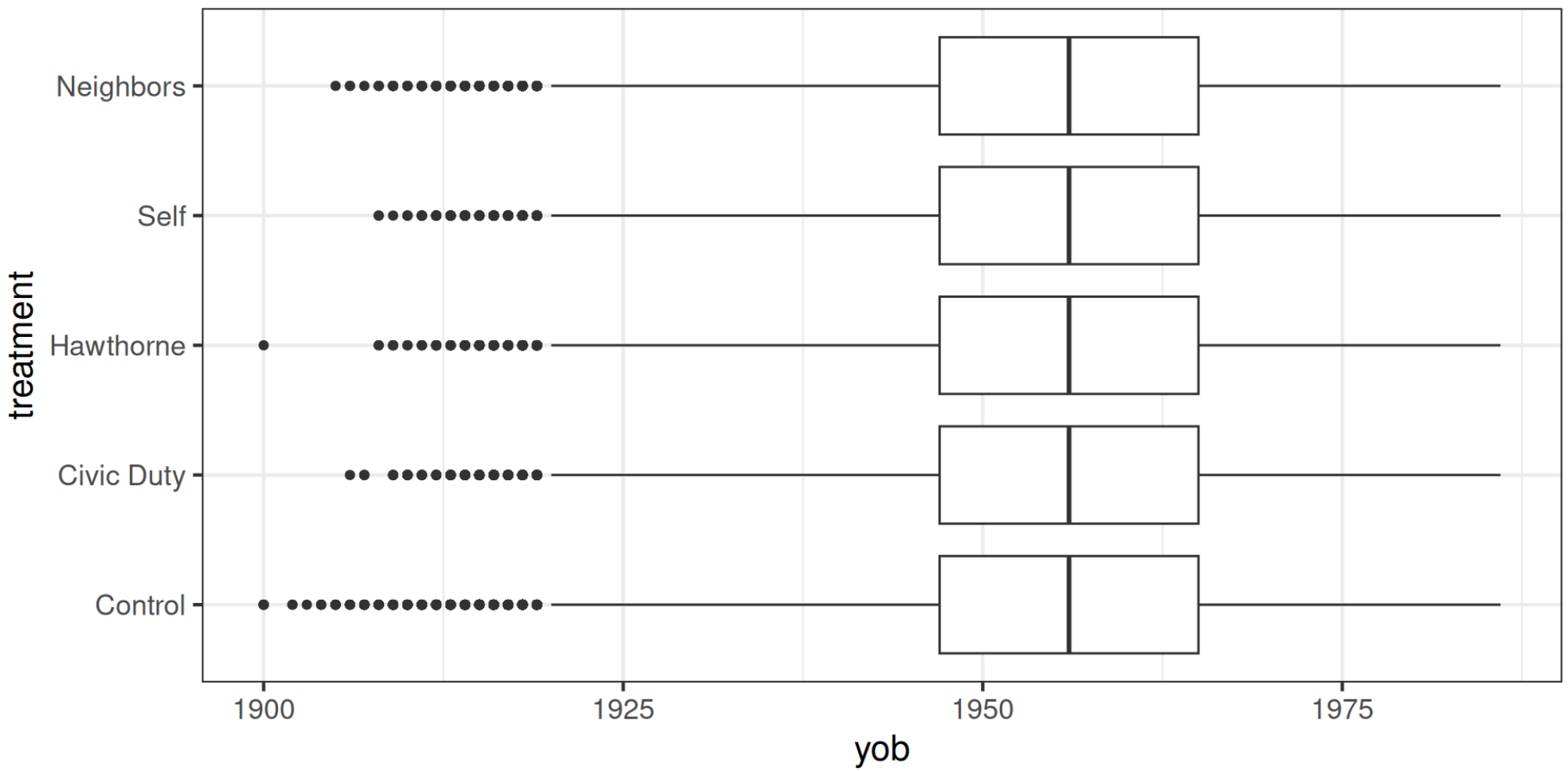
How many individuals in each condition?

```
df_ggl |>
  count(treatment) |>
  mutate(percent = 100 * n / sum(n))
```

```
# A tibble: 5 × 3
  treatment       n percent
  <fct>       <int>   <dbl>
1 Control    191243    55.6
2 Civic Duty  38218    11.1
3 Hawthorne   38204    11.1
4 Self        38218    11.1
5 Neighbors   38201    11.1
```

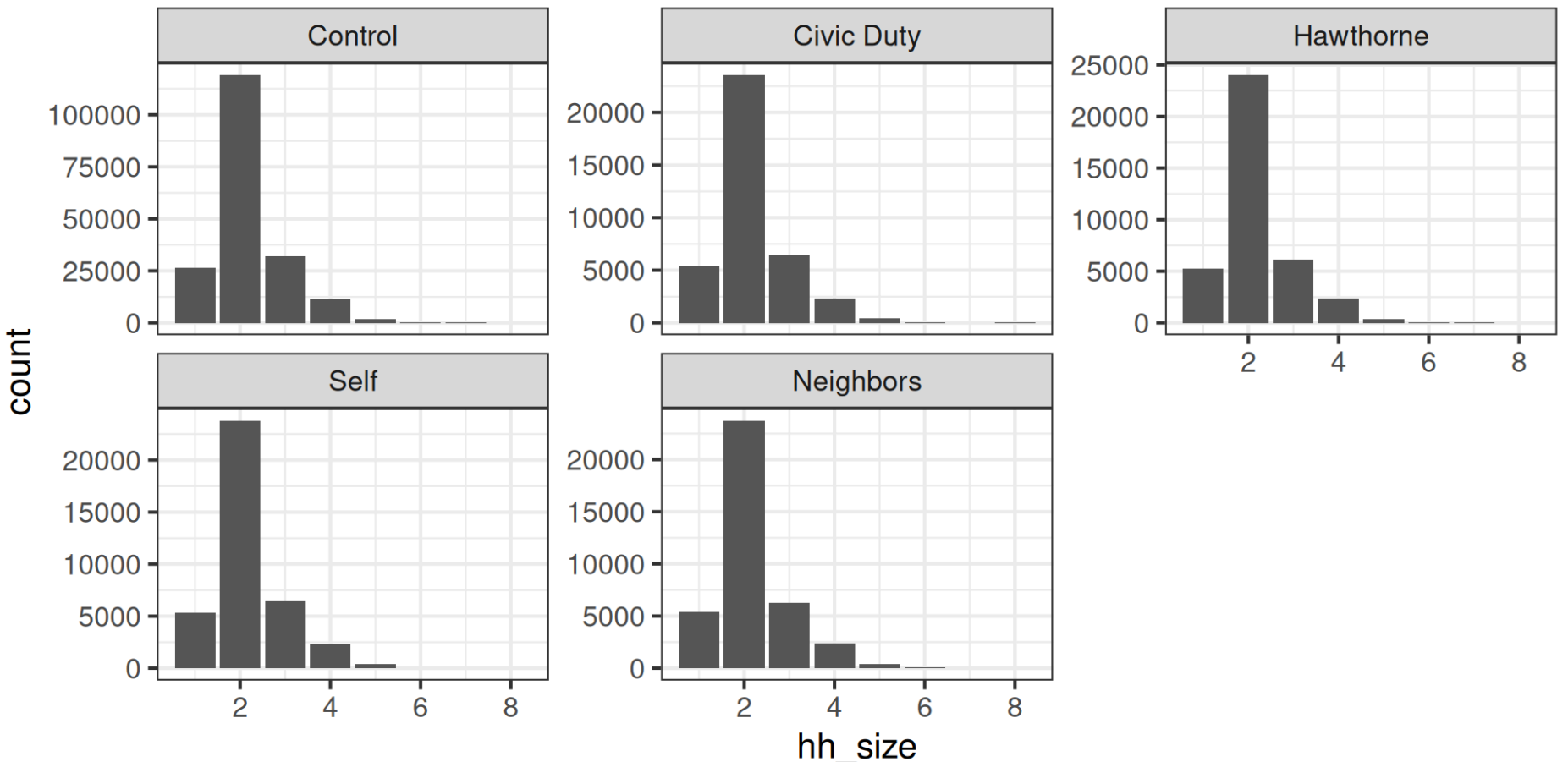
Checking for balance: Year of birth

```
ggplot(df_ggl, aes(x = yob, y = treatment)) +
  geom_boxplot()
```



Checking for balance: Household size

```
ggplot(df_ggl, aes(x = hh_size)) +
  geom_bar() +
  facet_wrap(~ treatment, ncol = 3, scales = "free_y")
```



Checking for balance: Sex

```
df_ggl |>
  group_by(treatment) |>
  summarize(pct_female = 100 * mean(sex == "female"))
```

```
# A tibble: 5 × 2
  treatment  pct_female
  <fct>           <dbl>
1 Control          49.9
2 Civic Duty       50.0
3 Hawthorne        49.9
4 Self             50.0
5 Neighbors        50.0
```

Checking for balance: Voting in prior elections

```
df_ggl |>
  mutate(p2004 = str_to_lower(p2004)) |>  # make consistent w/others
  group_by(treatment) |>
  summarize(across(g2000:p2004, ~ 100 * mean(. == "yes")))
```

```
# A tibble: 5 × 7
  treatment  g2000 g2002 g2004 p2000 p2002 p2004
  <fct>      <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
1 Control     84.3  81.1   100  25.2  38.9  40.0
2 Civic Duty  84.2  81.1   100  25.4  38.9  39.9
3 Hawthorne   84.4  81.3   100  25.0  39.4  40.3
4 Self        84.0  81.1   100  25.1  39.2  40.2
5 Neighbors   84.2  81.1   100  25.1  38.7  40.7
```

Group averages and differences

```
df_results <- df_ggl |>
  group_by(treatment) |>
  summarize(turnout = 100 * mean(voted == "Yes")) |>
  mutate(vs_control = turnout - turnout[treatment == "Control"],
         vs_civic = turnout - turnout[treatment == "Civic Duty"],
         vs_hawthorne = turnout - turnout[treatment == "Hawthorne"],
         vs_self = turnout - turnout[treatment == "Self"])

print(df_results)
```

```
# A tibble: 5 × 6
  treatment  turnout vs_control vs_civic vs_hawthorne vs_self
  <fct>        <dbl>      <dbl>    <dbl>        <dbl>   <dbl>
1 Control       29.7       0      -1.79        -2.57    -4.85
2 Civic Duty    31.5       1.79    0           -0.784   -3.06
3 Hawthorne     32.2       2.57    0.784        0       -2.28
4 Self          34.5       4.85    3.06         2.28     0
5 Neighbors     37.8       8.13    6.34         5.56     3.28
```

Making relevant comparisons

What's effect of strong social pressure vs no social pressure?

→ avg[vote | neighbors] - avg[vote | civic duty]

```
df_results$vs_civic[df_results$treatment == "Neighbors"]
```

```
[1] 6.341057
```

What's effect of strong social pressure vs weak social pressure?

→ avg[vote | neighbors] - avg[vote | self-treatment]

```
df_results$vs_self[df_results$treatment == "Neighbors"]
```

```
[1] 3.279672
```

Making relevant comparisons

What's effect of knowing you're being studied?

→ avg[vote | Hawthorne] - avg[vote | civic duty]

```
df_results$vs_civic[df_results$treatment == "Hawthorne"]
```

```
[1] 0.7836968
```

How cost-effective is {mailer} for get-out-the-vote?

→ avg[vote | {mailer}] - avg[vote | control]

```
df_results |> select(treatment, vs_control) |> deframe()
```

```
   Control Civic Duty  Hawthorne       Self  Neighbors
  0.000000   1.789934   2.573631   4.851319   8.130991
```

Gerber, Green, Larimer: Takeaways

For theories of voting:

- Civic duty considerations positively affect turnout
- Extrinsic motivations outweigh intrinsic motivations

For political practitioners:

- Surveillance + shaming works to get out the vote
- More cost effective than other methods
  - → Neighbors mailing: $1.93/vote
  - → Self-treatment mailing: $3.24/vote
  - → Door-to-door canvassing: $20/vote
  - → Phone calls: $35/vote

Limitations of the experimental method

External validity

What's the actual population the experimental sample was drawn from?

- Registered voters
- ... in Michigan (but not the Upper Peninsula!), in 2006
- ... living on blocks with 90%+ single family homes and 4+ households
- ... who voted in the 2004 general election
- ... who weren't too likely to vote by absentee ballot
- ... or to be Democratic primary voters

If you were trying to get out the vote for the 2023 Nashville mayoral runoff, how confident would you be in using the social pressure strategy?

Overcoming external validity concerns

Replication of similar experimental design under alternative conditions

- Greater confidence in generalizability across contexts
- Less worry about sampling error
  - → Not a major concern with 38,000+ obs per treatment group

Tons of replication efforts for GGL's experiment

- Mann 2010 in the 2007 Kentucky gubernatorial election
- Panagopoulos 2010 in 2007 elections in Monticello, IA and Holland, MI
- Rogers et al 2017 in the 2012 Wisconsin gubernatorial recall
- Gerber et al 2017 across 17 states in 2014 midterms

(but most polisci experiments don't get nearly this much attention!)

Costliness

Not trivial to replicate a field experiment of this scope

Just sending out the mailers would cost about $70,000

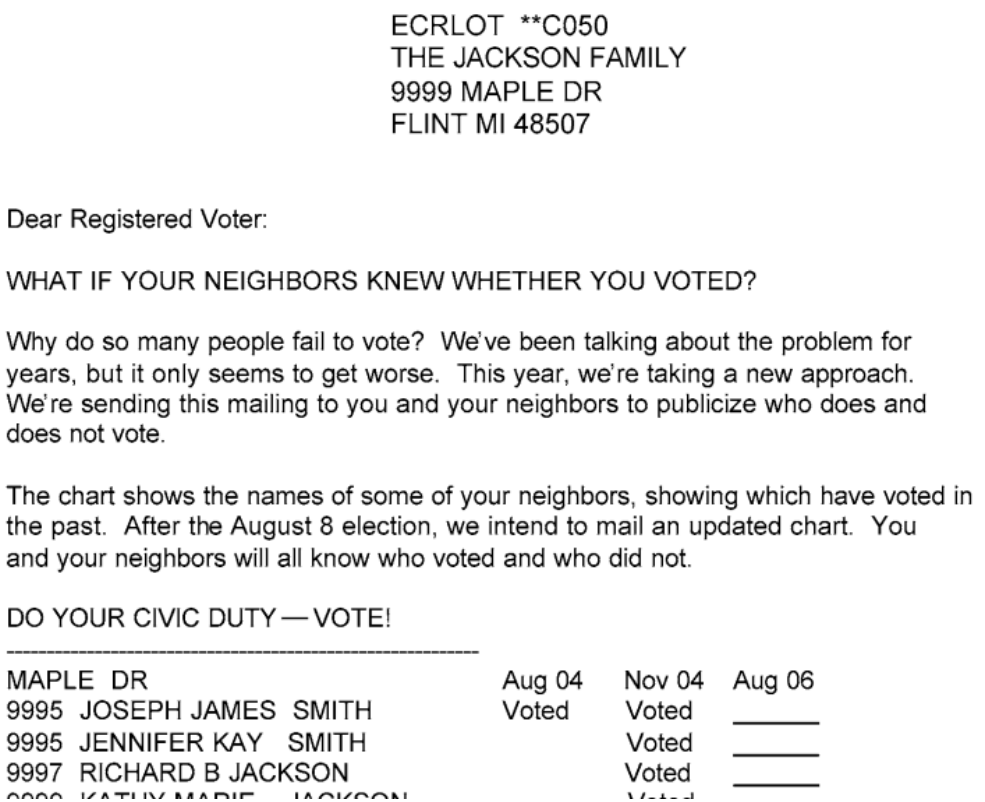
```
cost_per_mailer <- 0.30
inflation_since_2006 <- 1.548
number_of_mailers <- sum(df_ggl$treatment != "Control")

cost_per_mailer * inflation_since_2006 * number_of_mailers
```

```
[1] 70979.36
```

- Many interesting questions won't get a large-scale experimental study
- Need to draw inferences from "messier" research designs

Ethics: Micro



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9995 JENNIFER KAY SMITH		Voted	_____
9997 RICHARD B JACKSON		Voted	_____

Info is from public records

...but people may not expect it to be publicized

"many recipients of the Neighbors message called the phone number provided on the mailing and demanded to be removed from future mailing lists"

Is it ok to make people <u>feel</u> like their privacy has been violated?

Ethics: Macro

Study population was a non-representative subset of eligible voters

- Live on streets with 4+ households, but few apartments ⇝
  - → wealthier than average
  - → more suburban, less rural or urban than average
- Unlikely to vote in Dem primary ⇝
  - → whiter than average
  - → more male and/or married than average

Could you change not just turnout but also outcomes by only intervening on this subset of eligible voters?

Wrapping up

What we did today

1. Discussed the specifics of GGL's experimental design
    - Treatment tailored to study extrinsic component of civic duty
    - Different comparisons capture different questions
    - Evidence suggests relatively large effect of extrinsic concern
2. Discussed potential issues with experiments
    - External validity concerns $\rightsquigarrow$ Replication required
    - Ethical concerns $\rightsquigarrow$ Manipulating treatment assignment means we're affecting the political processes we set out to study

Next week

Problem Set 2 to be posted by Friday 1/31, due Friday 2/7

→ Problem Set 1 will be graded by Friday too

Next week's topic — statistical inference

→ How certain can we be about any particular result?

→ How much data is enough?

1. Read *Mastering 'Metrics* pages 33–46
2. Read ebook chapter **"The Most Dangerous Equation"**