DEMED: Using Facebook as a Research Tool Experiments on Facebook

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Session outline

- What are social media-based field experiments?
- Outcome measurement
- Ethical considerations
- Random assignment at the individual and cluster level
- Implications for statistical power

Online field experiments

"experiments that leverage platforms or systems that already exist on the Internet to study the motivations and behaviours of individuals, organizations, and even governments."

"tend to capitalize on the web's cababilities and the unique experience of cyberspace as an environment"

Muise and Pan (2019)

Social media-based field experiments

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Range of social media-based field experiments

- Effects of social media ads and messages (e.g. GOTV, voter registration)
- Induce political expression/ talk / deliberation
- Sharing of political information/reduction of exposure to disinformation
- Induce social interactions
- Social contact and reduction of prejudice / online harassment
- Incentivize online media consumption
- Effects of social comparison

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- An increasing number of important political interactions happen on social media.
- Social-media type of interventions can be less costly in terms of time-commitment.

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- Financial costs can be prohibitive.

Outcome measurement

- If possible, intermediate outcomes (clicks, likes, shares etc) should be measured on platform.
- But as political scientists we are often interested in outcomes beyond "likes and shares".
- "Hard outcomes" can be measured from public registers or via online panel surveys (e.g. Broockman, Kalla and Sekhon 2017, Foos et al. 2020).
- Linking offline and online data is a major challenge.

APSA Principles and Guidance for Human Subjects Research

1. Autonomy
2. Power
3. Consent
4. Deception
5. Harm and trauma
6. Confidentiality
7. Impact
8. Laws and regulations

Impact and consent

"Political science researchers conducting studies on political processes should consider the broader social impacts of the research process as well as the impact on the experience of individuals directly engaged by the research. In general, political science researchers should not compromise the integrity of political processes for research purposes without the consent of individuals that are directly engaged by the research process."

"Studies of interventions by third parties do not usually invoke this principle of impact."

APSA Principles and Guidance for Human Subjects Research

Why do field experimentalists sometimes forego informed consent

- Avoiding the Hawthorne Effect $\rightarrow$ avoid bias in the estimator
- Realism of the intervention, construct validity

The Hawthorne effect

- The effect of the research on the outcome itself. Research subjects adjust their behaviour in response to being studied. This may lead to the inference that an intervention has worked when it has not.

Individual-level assignment

- Individual-level treatment assignment on Facebook is possible via:
  1. uploading different email lists into FB ad-manager
  2. inviting subjects to follow FB pages or join FB groups
- Two feasible (and GDPR-compliant) strategies:
  1. Recruitment of subjects into online panel: participants consent to contact details being used in study.
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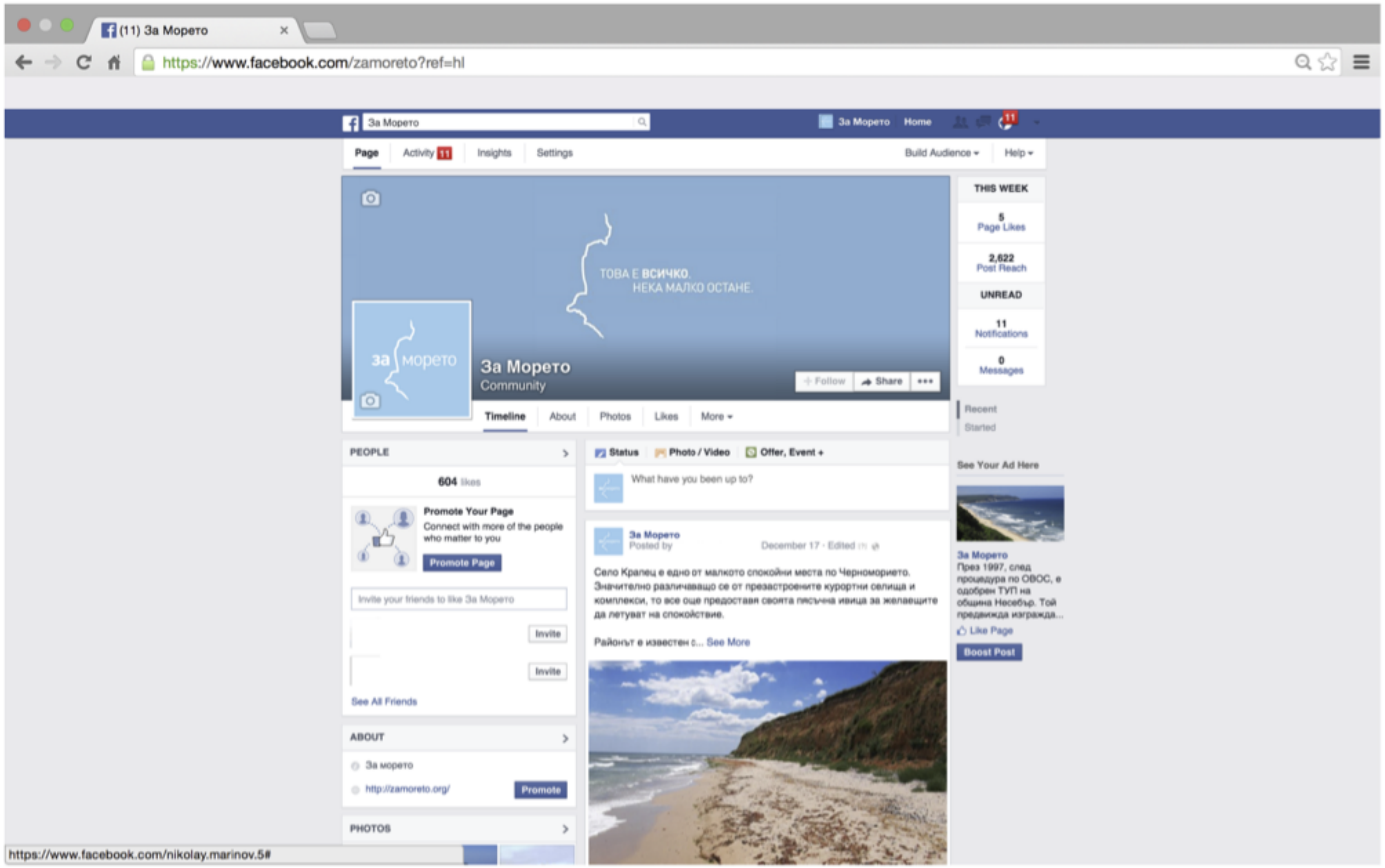
FB page as a treatment

- Study participants (18-60 years) were recruited via random sampling in Bulgarian towns and consented to participating in a panel study.
- After filling-in the baseline survey, subjects were randomly assigned to a) follow a pro-environment FB page b) subscribe to a pro-environment email newsletter c) control.
- The FB page and email newsletter shared pro-environment content for 8 weeks and we conducted an endline survey afterwards.

FB page as treatment



Foos et al. (2020)

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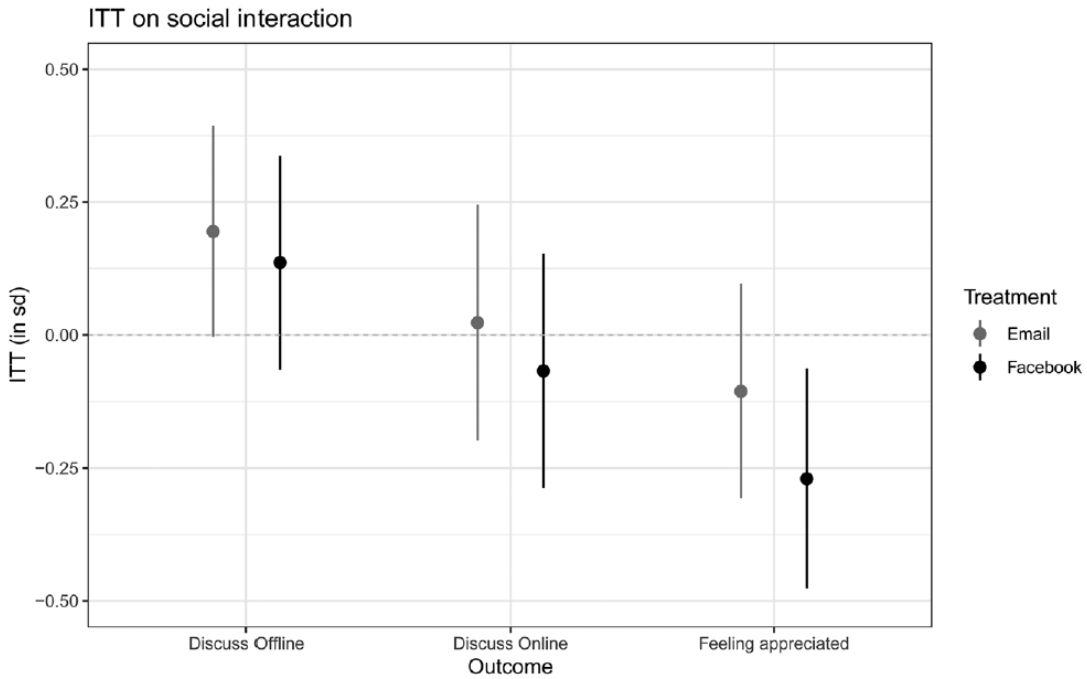

Figure 4. Effect of treatment assignment (ITTs) on social interaction—covariate-adjusted, 95 percent CIs.

Foos et al. (2020)

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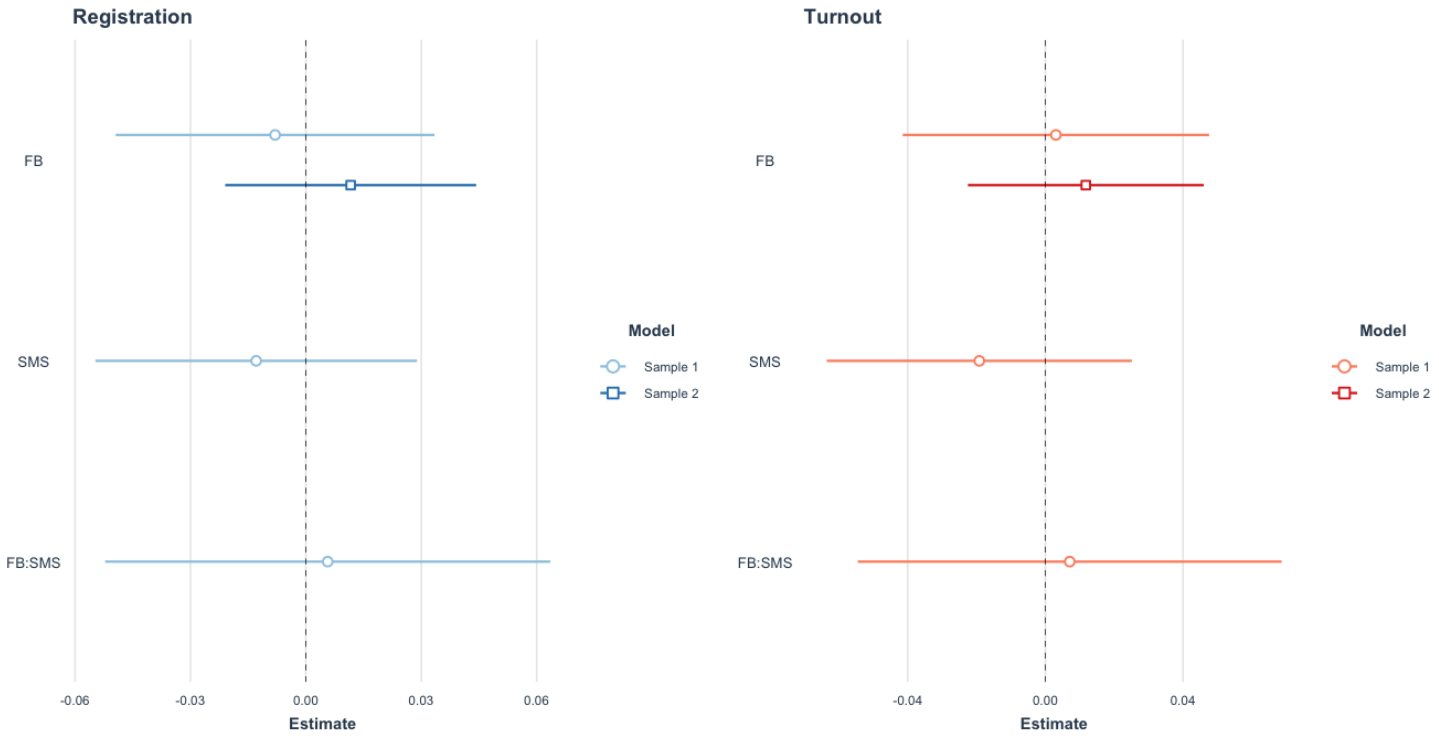
Example 2: Working from pre-existing email list

- Collaboration with civic society organisation in the UK on encouraging voter registration.
- Existing email list of members and supporters.
- Subjects with email address are assigned to different experimental groups.
- Email list of subjects in social media ad group are uploaded on Facebook Ad manager $\rightarrow$ subjects in FB treatment group receive targeted ads on Facebook and Instagram.

Assignment via email list



Foos, John, Unan and Cheng-Matsuno (2021)

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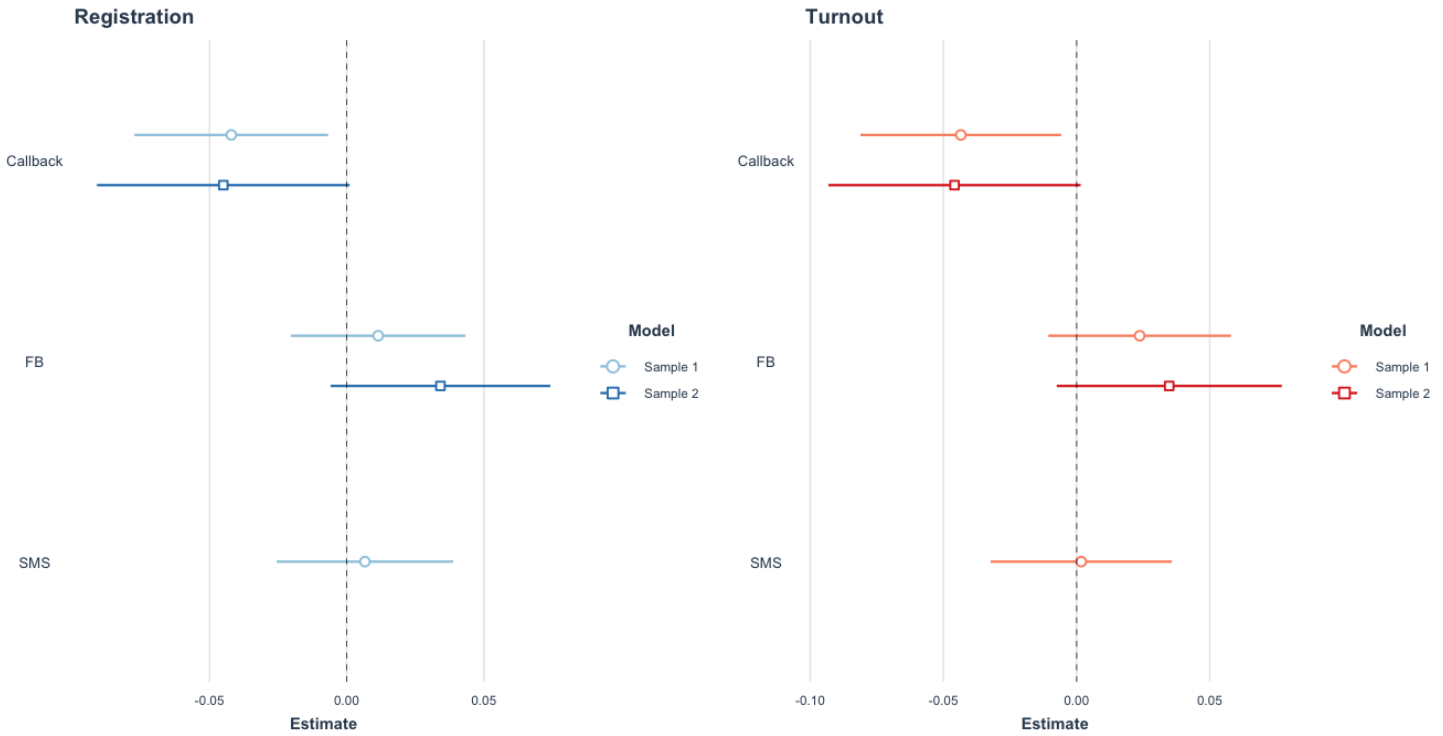

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- What goes into statistical power?
  1. Effect size
  2. Variance in the outcome
  3. Sample size

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- Cluster-random assignment means that all subjects in the same cluster are assigned *together* to the same experimental condition, e.g. every subject in the same Zoom room will either be treated or untreated.
- Cluster-random assignment is necessary when contact information is not available or cannot be used due to privacy regulations or because we expect that the non-interference assumption is violated in meaningful ways.

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- Under complete random assignment:

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- This is often summed up in the Intra-Cluster-Correlation (ICC). The ICC compares the variance within clusters to the variance between clusters. The ICC varies between 0 and 1. If the ICC is 1, then subjects within clusters do not vary from each other and N = k.

Cluster versus complete random assignment, following Gerber and Green (2012)

TABLE 3.6

Hypothetical schedule of potential outcomes for 12 classrooms in four schools—high sampling variability

		Classroom-level potential outcomes		Cluster-level mean potential outcomes	
School	Classroom	$Y_i(0)$	$Y_i(1)$	$Y_j(0)$	$Y_j(1)$
A	A-1	0	4		
A	A-2	1	5	1	5
A	A-3	2	6		
B	B-1	2	6		
B	B-2	3	7	3	7
B	B-3	4	8		
C	C-1	3	7		
C	C-2	4	8	4	8
C	C-3	5	9		
D	D-1	7	11		
D	D-2	8	12	8	12
D	D-3	9	13		

Cluster versus complete random assignment, following Gerber and Green (2012)

TABLE 3.7

Hypothetical schedule of potential outcomes for 12 classrooms in four schools—low sampling variability

		Classroom-level potential outcomes		Cluster-level mean potential outcomes	
School	Classroom	$Y_i(0)$	$Y_i(1)$	$Y_j(0)$	$Y_j(1)$
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A	A-2	3	7	4	8
A	A-3	9	13		
B	B-1	2	6		
B	B-2	3	7	4	8
B	B-3	7	11		
C	C-1	1	5		
C	C-2	4	8	3.3	7.3
C	C-3	5	9		
D	D-1	4	8		
D	D-2	8	12	4.7	8.7
D	D-3	2	6		

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- (Almost) always cluster your standard errors at the level at which the treatment is assigned.

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- (Almost) always cluster your standard errors at the level at which the treatment is assigned.
- If you assign subjects within postcode sectors to treatment and control, then you need to cluster your standard errors at the postcode sector level.

The penalty to clustering: Power simulation

https://egap.shinyapps.io/power-app/

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- Level of outcome measurement should be perfectly nested within the cluster used for assignment, e.g. postcode sector $\rightarrow$ postcode.
- Important that outcomes can be matched unambiguously to assignment and that boundaries do not overlap.

Example 3: Voter registration ads

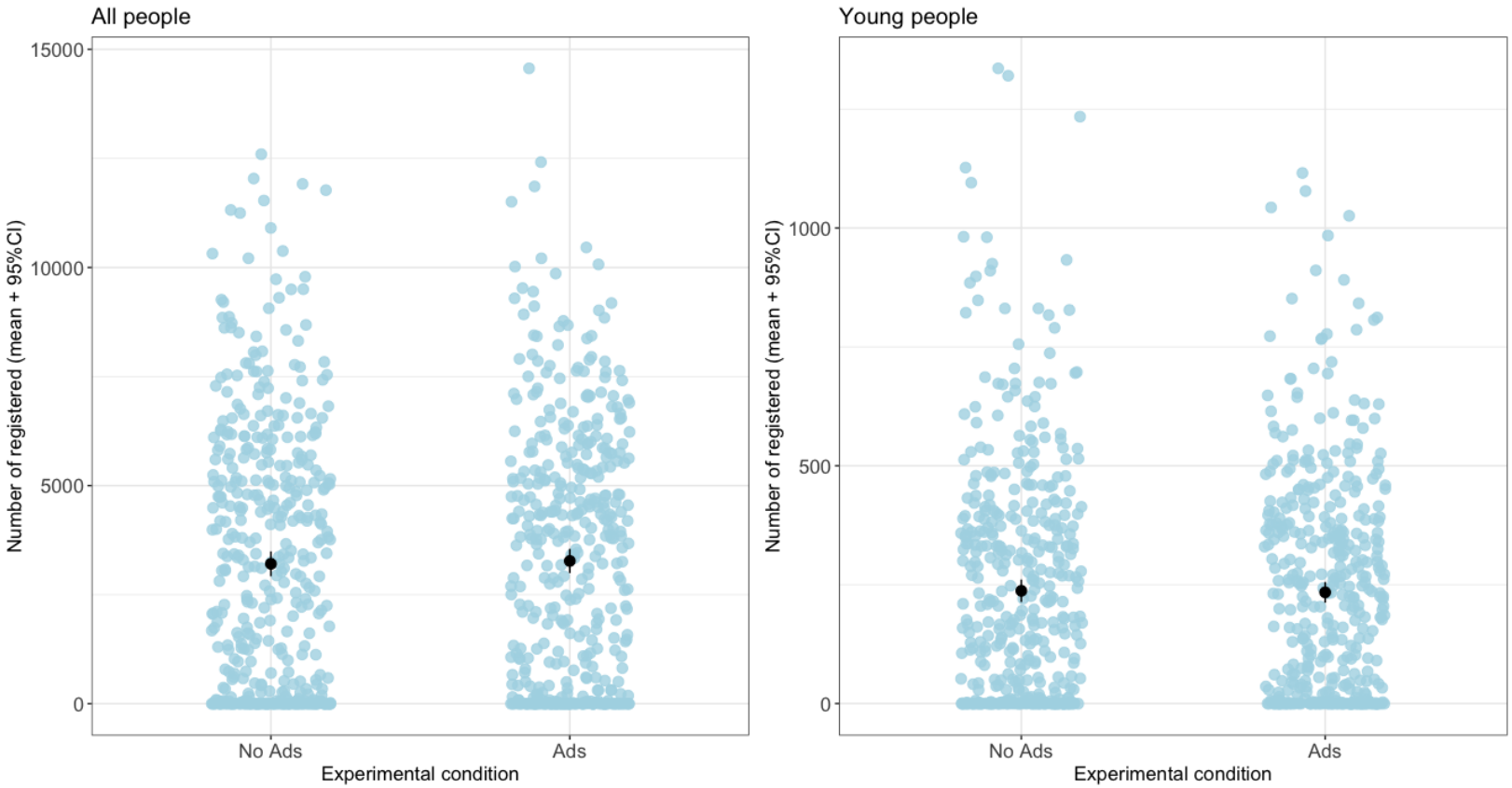
- Treatments: Voter registration videos on Instagram and Snapchat targeted at young voters (18-35).
- Young people nested within postcodes, nested within N=879 postcode sectors.
- Cluster random assignment at the postcode sector level: Postcode sectors are assigned with a probability of .5 to treatment, stratified by parliamentary constituency.

Social Media Ads

Outcome measurement

- Registration outcomes at the postcode sector and postcode levels are obtained post-election from de-identified registers.

Mean plots with 95% CIs



Foos, John, and Unan (2021)

Time for questions.

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