14.750x Media Lecture 2: Social Media and Political Protests

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Coordination and protests

- Suppose you want to organize a protest against a dictator. This is hard. Why?
- Suppose a few protesters go to the square.

Tahrir Square, Egypt

Empty

Coordination and protests

- Suppose you want to organize a protest against a dictator. This is hard. Why?
- Suppose a few protesters go to the square. What will happen?
- Suppose a million protesters go to the square.

Tahrir Square, Egypt

Full

Coordination and protests

- Suppose you want to organize a protest against a dictator. This is hard. Why?
- Suppose a few protesters go to the square. What will happen?
- Suppose a million protesters go to the square. What will happen now?
- Given this, coordination is important – but hard.

Starting a revolution

- Suppose that if there is a protest, the dictator's thugs will beat you up with probability $\min(\frac{100}{\sqrt{N}}, 1)$ where N is the number of protesters. Getting beaten up costs you c.
- Suppose the per-person benefit from overthrowing the autocrat is b. Suppose that the probability of overthrowing the dictator is increasing in the number of people who show up at the square. Suppose it's $\frac{N}{100000}$.
- Suppose everyone needs to decide simultaneously whether to protest or not. How do you decide?
- It depends on what everyone else will do. Why?

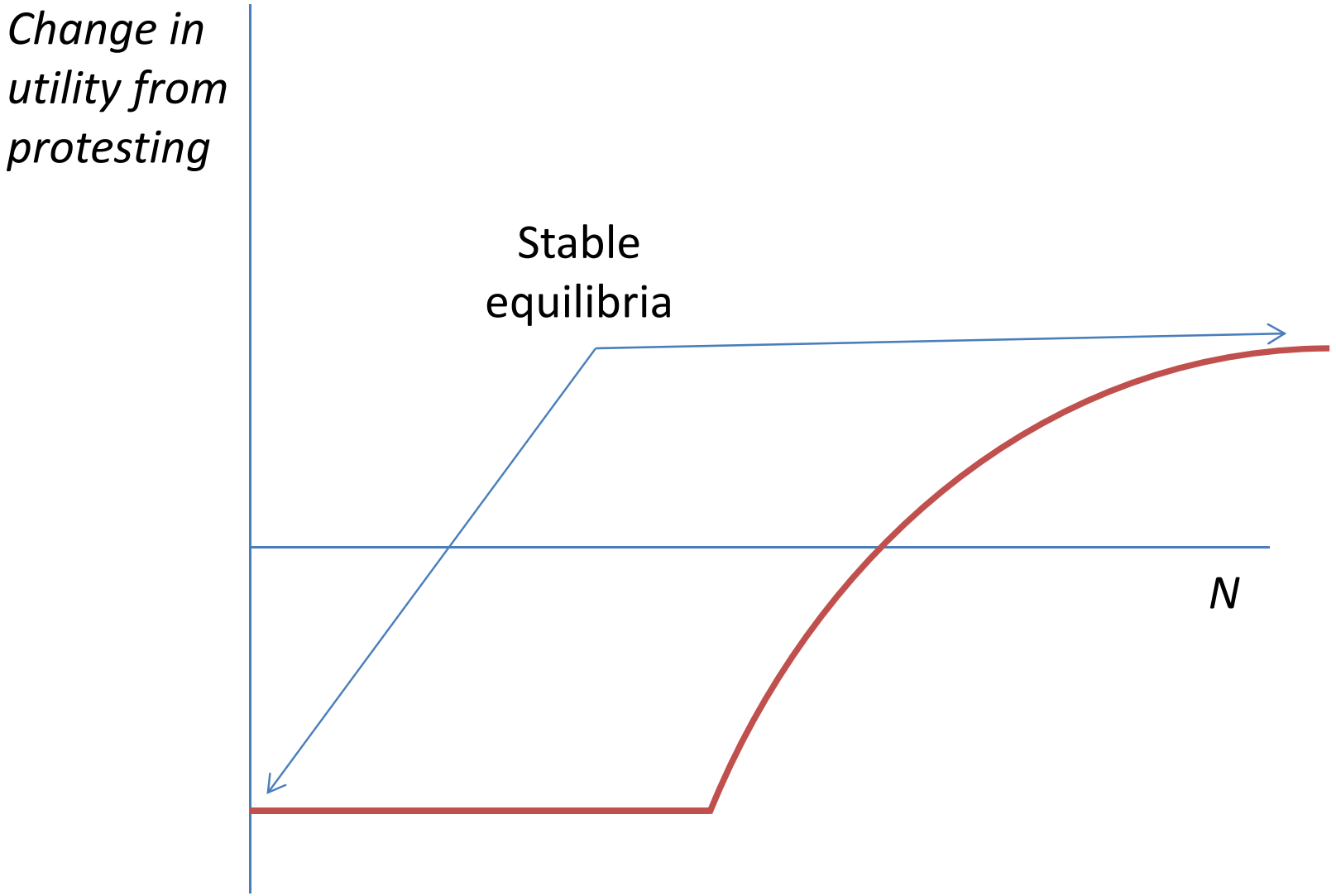
Starting a revolution

- Suppose you think that N people are going to show up anyway. What's your decision?
- If you don't go, you get b with probability $\frac{N}{100000}$ and pay no costs. So your utility is $\frac{N}{100000}$.
- If you do go, you get b with probability $\frac{N+1}{100000}$ and pay cost $\min(\frac{100}{\sqrt{N+1}}, 1)b$.
- So your change in utility from going is

$$\frac{1}{100000} - \min(\frac{100}{\sqrt{N+1}}, 1)b$$

- Your utility from going is increasing in what other people do, since the more people who go, the safer it is. So we can potentially have multiple equilibria.

Illustration



Starting a revolution

- What does this imply?
- Revolution requires coordination – we all need to go to the square on the same day.
- This is a reason why dictators try to suppress coordinating devices (Facebook, radio).
- But this raises two empirical questions:
  1. Are people more likely to protest if they know others will be protesting?
  2. Does social media actually facilitate protests?
- And also: what about protests in democratic environments?
- This is a exciting new area of research, so let's explore all three of these.

Is protesting a strategic complement?

Cantoni et al (2017): Protests as Strategic Games: Experimental Evidence from Hong Kong's Anti-Authoritarian Movement

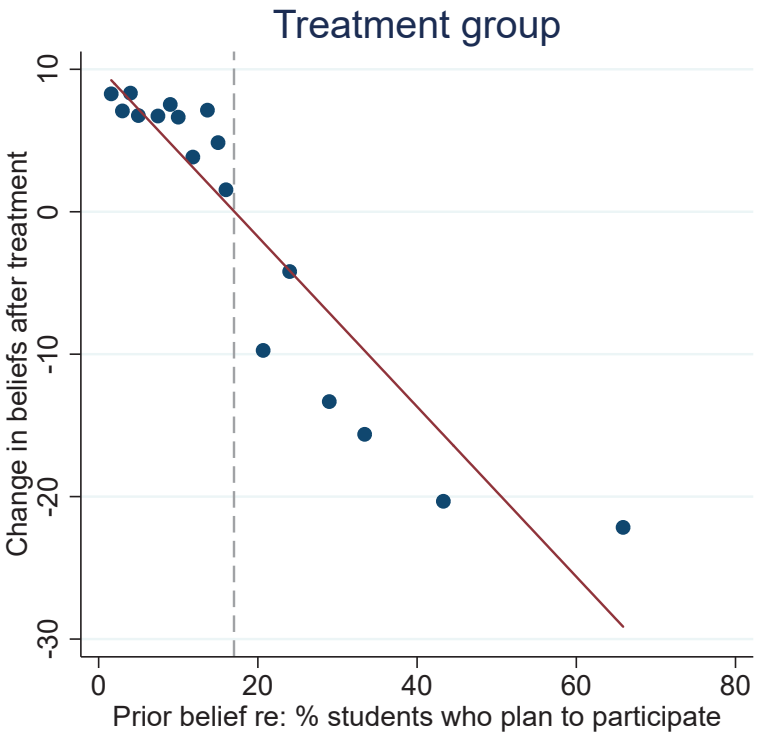
- A 'strategic complement' is when I am more likely to take an action of other people are taking the actions. The model I gave you before suggested protesting is a strategic complement.
- How would you want to test this?
- They look at a planned protest - pro-Democracy protests on July 1, 2016 in Hong Kong
- They elicit a) students planned participation and b) students beliefs about aggregate participation
- Then they randomize whether students are told (the day before the protest) the average number of students who play to participate (17 percent)
- Predictions?

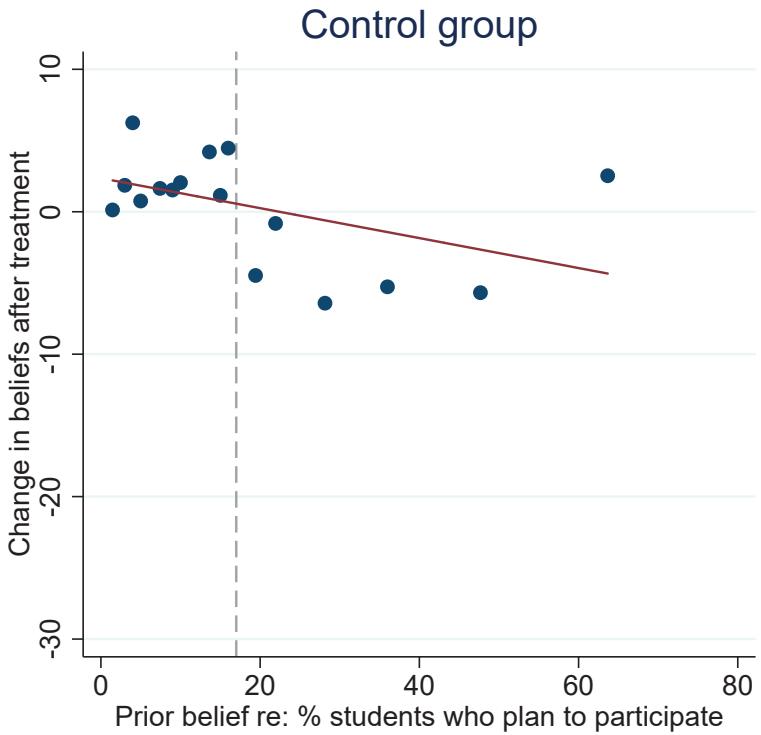
Is protesting a strategic complement?

Cantoni et al (2017): Protests as Strategic Games: Experimental Evidence from Hong Kong's Anti-Authoritarian Movement

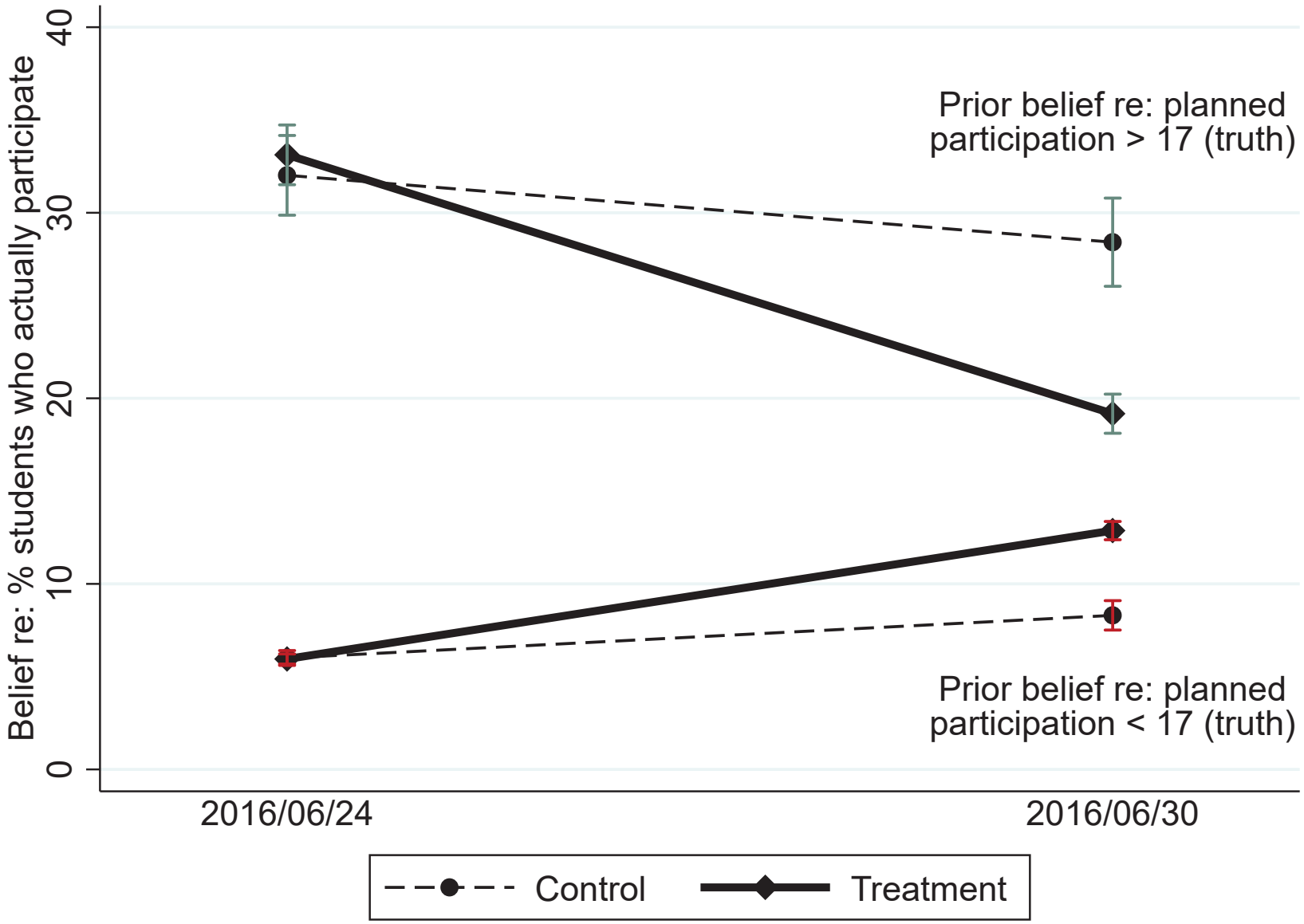
- Key point of *all* papers on beliefs is that treatment effect of giving you information depends on what you believed before
  - If your prior was below 17 percent, you update UP
  - If your prior was above 17 percent, you update DOWN
- Thus you need to look at all effects heterogeneously by priors.

Updating

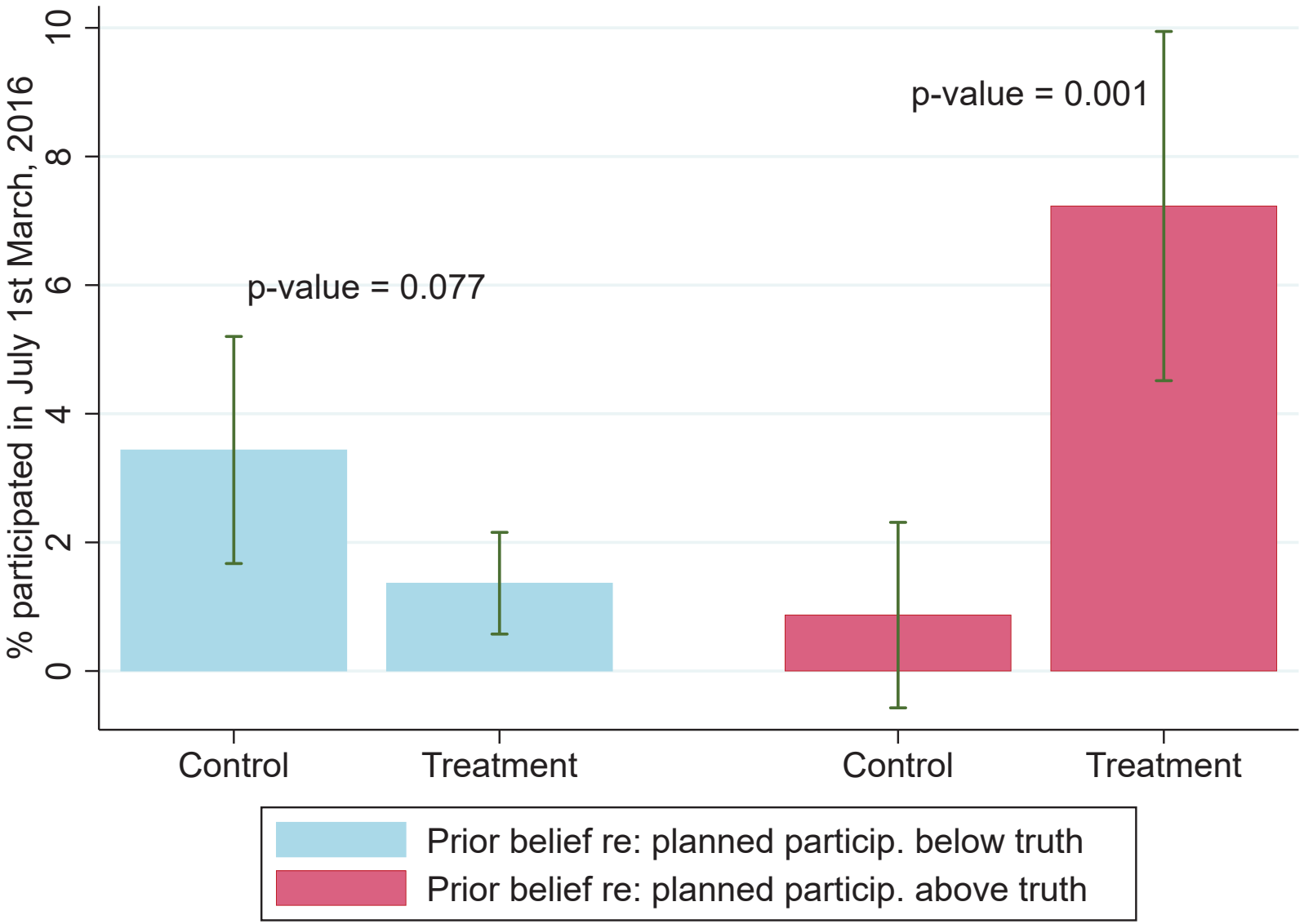

Treatment group
Change in beliefs after treatment
10
0
-10
-20
-30
0
20
40
60
80
Prior belief re: % students who plan to participate


Control group
Change in beliefs after treatment
10
0
-10
-20
-30
0
20
40
60
80
Prior belief re: % students who plan to participate

Updating


Belief re: % students who actually participate
0
10
20
30
40
2016/06/24
2016/06/30
Prior belief re: planned participation > 17 (truth)
Prior belief re: planned participation < 17 (truth)
Control
Treatment

Results


% participated in July 1st March, 2016
0
2
4
6
8
10
p-value = 0.077
p-value = 0.001
Control
Treatment
Control
Treatment
Prior belief re: planned particip. below truth
Prior belief re: planned particip. above truth

Does social media facilitate protest?

Enikolopov et al 2016: Social Media and Protest Participation: Evidence from Russia

- Does this matter? Lots of interest in role of social networks in facilitating protests, esp. vis-a-vis Arab spring
- Enikolopov et al look at this in context of Russia, looking at VK (Russian social network)
- Empirical idea: VK was launched by Pavel Durov in 2006, and started by inviting his classmates to participate. Network is largest in these cities.
- They show that there are more protests in 2011 in cities with more classmates of Durov.
- They control for average number of students from various cities studying at same university in other cohorts.

First stage

Table 1. Determinants of VK penetration in 2011 (first stage regression).

	Log (number of VK users), Aug 2011						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log (SPbSU students), same 5-year cohort as VK founder	0.4847***	0.1581***	0.1416***	0.1322***	0.1393***	0.1371***	0.1360***
	[0.1443]	[0.0425]	[0.0466]	[0.0489]	[0.0482]	[0.0463]	[0.0488]
Log (SPbSU students), one cohort younger than VK founder	0.5741***	-0.0292	-0.0259	-0.0452	-0.0433	-0.0464	-0.0457
	[0.1064]	[0.0552]	[0.0463]	[0.0461]	[0.0468]	[0.0472]	[0.0474]
Log (SPbSU students), one cohort older than VK founder	0.3101	0.0250	0.0058	0.0161	0.0175	0.0137	0.0142
	[0.1866]	[0.0523]	[0.0472]	[0.0468]	[0.0467]	[0.0445]	[0.0454]
Regional center		0.2952***	0.3932***	0.3015*	0.2563*	0.3008*	0.3026*
		[0.0899]	[0.1268]	[0.1583]	[0.1526]	[0.1539]	[0.1523]
Distance to Saint Petersburg, km			0.0002	0.0001	0.0001	0.0002	0.0000
			[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Distance to Moscow, km			-0.0002	-0.0002	-0.0002	-0.0003	-0.0001
			[0.0001]	[0.0001]	[0.0001]	[0.0002]	[0.0001]
Rayon center (county seat)			0.0045	-0.0142	-0.0134	-0.0056	-0.0155
			[0.0916]	[0.0873]	[0.0869]	[0.0906]	[0.0843]
Log (average wage), city-level, 2011			0.1688	0.2108	0.1977	0.1756	0.1386
			[0.1573]	[0.1637]	[0.1686]	[0.1691]	[0.1571]
Presence of a university in a city, 2011				-0.0224	-0.0087	-0.0348	-0.0056
				[0.1496]	[0.1468]	[0.1478]	[0.1441]
Internet penetration, region-level, 2011				-0.1190	-0.1572	-0.0677	-0.0875
				[0.2304]	[0.2144]	[0.2272]	[0.2254]
Log (number of Odnoklassniki users), 2014				0.1475*	0.1391*	0.1322	0.1706**
				[0.0798]	[0.0806]	[0.0801]	[0.0793]
Ethnic fractionalization, 2010				0.4041*	0.4872**	0.5660***	0.4599**
				[0.2149]	[0.2073]	[0.2016]	[0.2197]
Observations	625	625	625	625	625	625	625
R-squared	0.4031	0.8263	0.8486	0.8517	0.8546	0.8550	0.8540
Population controls		Yes***	Yes***	Yes***	Yes**	Yes***	Yes***
Age cohort controls			Yes**	Yes**	Yes***	Yes**	Yes**
Education controls			Yes***	Yes***	Yes***	Yes***	Yes***
Electoral controls, 1995					Yes		
Electoral controls, 1999						Yes*	
Electoral controls, 2003							Yes
p-value for equlity of coefficients for three cohorts	0.555	0.045**	0.059*	0.057*	0.048**	0.051*	0.047**
p-value for equlity of coefficients of Durov's and younger cohort	0.679	0.019**	0.021**	0.017**	0.015**	0.016**	0.014**
p-value for equlity of coefficients of Durov's and older cohort	0.458	0.054*	0.049**	0.088*	0.072*	0.069*	0.072*

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. When "Yes" is added to indiciate inclusion of a group of controls, a significance level is reported immediately after for this group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), vote against all, and electoral turnout for a corresponding year.

Reduced form

Table 2. Student cohorts and protest participation in 2011. Reduced form estimation.

	Log (number of protesters), Dec 2011				Incidence of protests, dummy, Dec 2011			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (SPbSU students), same 5-year cohort as VK founder	0.253**	0.259**	0.263**	0.274**	0.062***	0.062***	0.064***	0.065***
	[0.114]	[0.114]	[0.115]	[0.116]	[0.020]	[0.020]	[0.020]	[0.021]
Log (SPbSU students), one cohort younger than VK founder	0.152	0.150	0.137	0.160	0.012	0.011	0.009	0.012
	[0.105]	[0.105]	[0.105]	[0.106]	[0.020]	[0.020]	[0.020]	[0.020]
Log (SPbSU students), one cohort older than VK founder	-0.075	-0.072	-0.082	-0.068	-0.017	-0.016	-0.018	-0.015
	[0.113]	[0.113]	[0.112]	[0.113]	[0.020]	[0.020]	[0.020]	[0.020]
Regional center	0.287	0.288	0.318	0.292	-0.015	-0.013	-0.009	-0.014
	[0.488]	[0.480]	[0.480]	[0.487]	[0.099]	[0.097]	[0.096]	[0.098]
Distance to Saint Petersburg, km	-0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Distance to Moscow, km	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Rayon center (county seat)	0.003	0.005	-0.029	-0.051	-0.001	0.001	-0.007	-0.011
	[0.044]	[0.046]	[0.048]	[0.054]	[0.009]	[0.009]	[0.010]	[0.011]
Log (average wage), city-level, 2011	0.100	0.147	0.001	-0.068	0.021	0.039	0.007	-0.014
	[0.176]	[0.190]	[0.193]	[0.184]	[0.034]	[0.037]	[0.036]	[0.034]
Presence of a university in a city, 2011	0.870**	0.876**	0.860**	0.898**	0.196**	0.195**	0.195**	0.200**
	[0.423]	[0.423]	[0.422]	[0.426]	[0.098]	[0.098]	[0.097]	[0.097]
Internet penetration, region-level, 2011	0.138	0.181	0.175	0.149	-0.013	0.005	-0.003	-0.007
	[0.243]	[0.240]	[0.280]	[0.257]	[0.045]	[0.045]	[0.054]	[0.048]
Log (number of Odnoklassniki users), 2014	0.104	0.081	0.157	0.133	0.032*	0.024	0.041*	0.034*
	[0.109]	[0.120]	[0.123]	[0.119]	[0.017]	[0.019]	[0.021]	[0.019]
Ethnic fractionalization, 2010	-0.580*	-0.516	-0.468	-0.506	-0.089	-0.081	-0.071	-0.067
	[0.321]	[0.335]	[0.337]	[0.343]	[0.059]	[0.061]	[0.062]	[0.062]
Observations	625	625	625	625	625	625	625	625
R-squared	0.823	0.826	0.828	0.826	0.776	0.780	0.781	0.781
Population controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Age cohort controls	Yes*	Yes**	Yes**	Yes**	Yes**	Yes***	Yes***	Yes***
Education controls	Yes*	Yes**	Yes**	Yes**	Yes*	Yes*	Yes*	Yes*
Electoral controls, 1995		Yes**				Yes**		
Electoral controls, 1999			Yes**				Yes*	
Electoral controls, 2003				Yes*				Yes***
p-value for equlity of coefficients for three cohorts	0.271	0.271	0.250	0.247	0.078*	0.071*	0.058*	0.069*
p-value for equlity of coefficients of Durov's and younger cohort	0.528	0.489	0.430	0.487	0.089*	0.073*	0.067*	0.079*
p-value for equlity of coefficients of Durov's and older cohort	0.115	0.111	0.099*	0.102	0.031**	0.032**	0.025**	0.028**

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. When "Yes" is added to indiciate inclusion of a group of controls, a significance level is reported immediately after for this group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), vote against all, and electoral turnout for a corresponding year.

Table 3. VK penetration and protest participation in 2011.

Panel A. Number of protesters

	Log (number of protesters), Dec 2011							
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), Aug 2011	1.912**	1.863**	1.920**	2.015**	0.228***	0.216***	0.216***	0.227***
	[0.900]	[0.862]	[0.886]	[0.906]	[0.072]	[0.072]	[0.074]	[0.076]
Log (SPbSU students), one cohort younger than VK founder	0.238*	0.231*	0.227*	0.252*	0.224**	0.224**	0.211*	0.236**
	[0.124]	[0.125]	[0.125]	[0.131]	[0.107]	[0.109]	[0.108]	[0.108]
Log (SPbSU students), one cohort older than VK founder	-0.106	-0.105	-0.108	-0.097	0.013	0.019	0.011	0.027
	[0.143]	[0.143]	[0.136]	[0.144]	[0.092]	[0.091]	[0.089]	[0.092]
Population controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Age cohort controls	Yes	Yes	Yes	Yes	Yes*	Yes*	Yes**	Yes**
Education controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Electoral controls, 1995		Yes				Yes		
Electoral controls, 1999			Yes				Yes	
Electoral controls, 2003				Yes*				Yes**
Observations	625	625	625	625	625	625	625	625
Effective F-statistics (Olea Montiel and Pflueger 2013)	276.8	274	274	274				

Panel B. Probability of protests

	Incidence of protests, dummy, Dec 2011							
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), Aug 2011	0.466***	0.446***	0.464***	0.481***	0.039***	0.037***	0.037***	0.039***
	[0.180]	[0.169]	[0.174]	[0.181]	[0.013]	[0.013]	[0.013]	[0.014]
Log (SPbSU students), one cohort younger than VK founder	0.033	0.030	0.031	0.034	0.029	0.029	0.027	0.031
	[0.025]	[0.026]	[0.026]	[0.027]	[0.020]	[0.021]	[0.021]	[0.020]
Log (SPbSU students), one cohort older than VK founder	-0.024	-0.023	-0.025	-0.021	0.006	0.007	0.005	0.009
	[0.029]	[0.029]	[0.028]	[0.030]	[0.017]	[0.017]	[0.017]	[0.018]
Population controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Age cohort controls	Yes	Yes	Yes	Yes	Yes**	Yes**	Yes**	Yes**
Education controls	Yes	Yes	Yes*	Yes	Yes	Yes	Yes	Yes
Other controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Electoral controls, 1995		Yes				Yes**		
Electoral controls, 1999			Yes				Yes	
Electoral controls, 2003				Yes				Yes**
Observations	625	625	625	625	625	625	625	625
Effective F-stat (Montiel Olea and Pflueger 2013)	276.8	274	274	274				

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. When "Yes" is added to indiciate inclusion of a group of controls, a significance level is reported immediately after for this group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), vote against all, and electoral turnout for a corresponding year. Other controls include dummy for regional and county centers, distances to Moscow and St Peterburg, log (average wage), share of people with higher education in 2002, internet penetration in 2011, log (Odnoklassniki users in 2014).

Table 4. VK Penetration and pre-VK Protests.

Panel A. Participation in earlier protests								
	Log (number of protesters), 1987-1992				Log (pro-democracy protesters), 1987-1992			
Log (number of VK users), Aug 2011	0.534	0.427	0.284	0.493	0.144	-0.011	0.017	0.141
	[1.883]	[1.943]	[1.839]	[1.927]	[1.495]	[1.510]	[1.491]	[1.573]
P-value for equality of coefficients with that in Table 4	0.492	0.488	0.413	0.463	0.295	0.277	0.265	0.288
	Log (participants in labor protests), 1997-2002				Log (participants in social protests), 2005			
Log (number of VK users), Aug 2011	-0.562	-0.537	-1.380	-0.497	-0.313	-0.292	-0.075	-0.042
	[1.877]	[1.716]	[1.831]	[1.962]	[1.632]	[1.497]	[1.569]	[1.600]
P-value for equality of coefficients with that in Table 4	0.216	0.193	0.094*	0.220	0.273	0.256	0.314	0.304
Panel B. Incidence of earlier protests								
	Incidence of protests, 1987-1992				Incidence of pro-democracy protests, 1987-1992			
Log (number of VK users), Aug 2011	0.009	0.007	-0.015	0.024	-0.011	-0.020	-0.023	0.004
	[0.281]	[0.282]	[0.267]	[0.281]	[0.195]	[0.195]	[0.191]	[0.198]
P-value for equality of coefficient with that in Table 5	0.194	0.202	0.155	0.197	0.090*	0.092*	0.078*	0.091*
	Incidence of labor protests, 1997-2002				Incidence of social protests, 2005			
Log (number of VK users), Aug 2011	-0.070	-0.060	-0.172	-0.036	-0.057	-0.055	-0.022	-0.019
	[0.243]	[0.219]	[0.238]	[0.256]	[0.239]	[0.221]	[0.230]	[0.235]
P-value for equality of coefficient with that in Table 5	0.056*	0.047**	0.021**	0.065*	0.105	0.099*	0.123	0.117
Population, Age cohorts, Education, and Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Electoral controls, 1995		Yes				Yes		
Electoral controls, 1999			Yes				Yes	
Electoral controls, 2003				Yes				Yes
Observations	625	625	625	625	625	625	625	625

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" indiciates inclusion of a corresponding group of controls. Significance level is NOT reported after each group of controls for the purpose of brevity. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), vote against all, and electoral turnout for a corresponding year. Other controls include dummy for regional and county centers , distances to Moscow and St Peterburg, log (average wage), share of people with higher education in 2002, internet penetration in 2011, log (Odnoklassniki users in 2014). P-values for equality of coefficients are calculated relative to a corresponding coefficient in columns (1)-(4) of Tables 4 and 5, using a 3sls framework.

Table 6. VK penetration and Voting Outcomes.

	Voting share for United Russia, 2007				Voting share for United Russia, 2011			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), Aug 2011	0.035	0.019	0.045	0.003	0.230*	0.179*	0.230*	0.182*
	[0.050]	[0.041]	[0.046]	[0.037]	[0.128]	[0.099]	[0.118]	[0.104]
Log (SPbSU students), one cohort younger than VK founder	-0.007	-0.004	-0.006	-0.007	-0.002	0.002	-0.001	0.000
	[0.009]	[0.008]	[0.008]	[0.007]	[0.017]	[0.014]	[0.016]	[0.013]
Log (SPbSU students), one cohort older than VK founder	0.002	0.001	-0.000	-0.003	0.004	0.006	0.001	-0.002
	[0.008]	[0.007]	[0.008]	[0.006]	[0.017]	[0.013]	[0.015]	[0.013]
Population controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age cohort controls	Yes***	Yes***	Yes***	Yes**	Yes	Yes	Yes	Yes
Education controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Other controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Electoral controls, 1995		Yes***				Yes***		
Electoral controls, 1999			Yes***				Yes***	
Electoral controls, 2003				Yes***				Yes***
Observations	625	625	625	625	625	625	625	625
Effective F-statistics (Olea Montiel and Pflueger 2013)	276.8	274	274	274	276.8	274	274	274

	Voting share for Medvedev, 2008				Voting Share for Putin, 2012			
Log (number of VK users), Aug 2011	0.125*	0.115*	0.137**	0.098*	0.127*	0.111*	0.127*	0.096
	[0.071]	[0.062]	[0.067]	[0.054]	[0.073]	[0.065]	[0.067]	[0.058]
Log (SPbSU students), one cohort younger than VK founder	-0.005	-0.003	-0.005	-0.004	0.002	0.003	0.003	0.002
	[0.011]	[0.009]	[0.010]	[0.008]	[0.011]	[0.010]	[0.010]	[0.008]
Log (SPbSU students), one cohort older than VK founder	0.001	-0.000	-0.003	-0.003	0.008	0.007	0.005	0.003
	[0.009]	[0.008]	[0.009]	[0.007]	[0.011]	[0.010]	[0.010]	[0.009]
Population controls	Yes	Yes	Yes*	Yes**	Yes	Yes	Yes*	Yes*
Age cohort controls	Yes**	Yes*	Yes**	Yes	Yes	Yes	Yes	Yes
Education controls	Yes	Yes	Yes	Yes	Yes***	Yes***	Yes***	Yes***
Other controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Electoral controls, 1995		Yes***				Yes***		
Electoral controls, 1999			Yes***				Yes***	
Electoral controls, 2003				Yes***				Yes***
Observations	625	625	625	625	625	625	625	625
Effective F-statistics (Olea Montiel and Pflueger 2013)	276.8	274	274	274	276.8	274	274	274

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. When "Yes" is added to indiciate inclusion of a group of controls, a significance level is reported immediately after for this group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), vote against all, and electoral turnout for a corresponding year. Other controls include dummy for regional and county centers, distances to Moscow and St Peterburg, log (average wage), share of people with higher education in 2002, internet penetration in 2011, log (Odnoklassniki users in 2014).

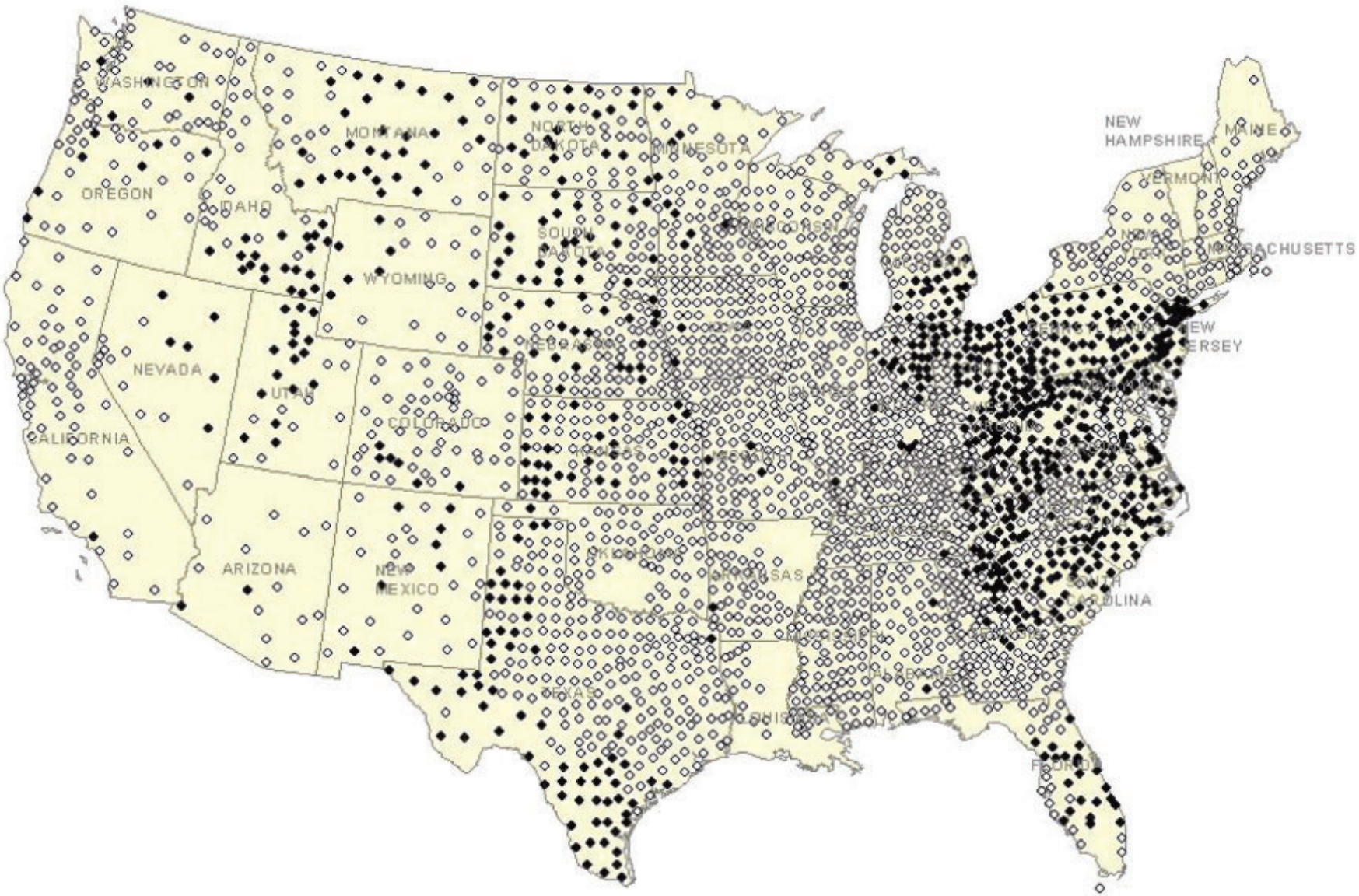
Do Protests Matter in democracies?

Madestam et al 2013: Do Political Protests Matter? Evidence from the Tea Party Movement

- Why might protests matter?
- Empirical test
  - Madestam et al look at the Tea Party movement in the United States
  - Began with coordinated national protests on Tax Day, April 15, 2009
  - But, in some places, it was raining that day
  - Question is: what is the long-run implications of rain on April 15, 2009 on ultimate voting outcomes?
  - Empirical concerns?
  - Need to condition flexibly on probability of rainfall. But that's easy enough to do.
  - So estimate

$$Outcome_c = RainyTaxDay_c + ProbabilityRain_c + Controls + \epsilon_c$$

Variation


WASHINGTON
OREGON
IDAHO
MONTANA
NORTH DAKOTA
MINNESOTA
WYOMING
NEVADA
UTAH
COLORADO
CALIFORNIA
ARIZONA
NEW MEXICO
TEXAS
NEW HAMPSHIRE
MAINE
VERMONT
MASSACHUSETTS
FLORIDA

Checking the pre-period

Exogeneity Check at the County Level

	Republican votes, U.S. House, 2008				Democratic votes, U.S. House, 2008		Turnout, U.S. House, 2008		Obama vote share, 2008	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable	Votes, % of population		Votes, % of votes		Votes, % of population		Votes, % of population		Obama vote share, 2008	
Rainy protest	0.53	0.46	0.61	0.99	0.66	0.23	0.93	0.47	1.25	0.58
	(0.50)	(0.52)	(1.25)	(1.32)	(0.63)	(0.62)	(0.63)	(0.62)	(1.39)	(1.00)
Observations	2,758	2,758	2,758	2,758	2,758	2,758	2,758	2,758	2,758	2,758
R-squared	0.77	0.79	0.74	0.76	0.76	0.79	0.73	0.78	0.66	0.81
Election Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Demographic Controls	N	Y	N	Y	N	Y	N	Y	N	Y
Dep. Var. mean	17.56	17.56	43.69	43.69	21.37	21.37	40.05	40.05	52.27	52.27

First stage

THE EFFECT OF RAIN ON THE NUMBER OF TEA PARTY PROTESTERS IN 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable	Protesters, % of population				Protesters, '000				log(Protesters)
Rainy protest	−0.082***	−0.170***	−0.128***	−0.108***	−0.096***	−0.190***	−0.165***	−0.228**	−0.473**
	(0.021)	(0.046)	(0.036)	(0.034)	(0.023)	(0.051)	(0.055)	(0.096)	(0.211)
Observations	2,758	2,758	2,758	542	2,758	2,758	2,758	542	478
R-squared	0.16	0.14	0.15	0.22	0.41	0.41	0.41	0.40	0.43
Protesters variable	Mean	Max	Mean	Mean	Mean	Max	Mean	Mean	Mean
Rain variable	Dummy	Dummy	Continuous	Dummy	Dummy	Dummy	Continuous	Dummy	Dummy
Sample counties	All	All	All	Protesters > 0	All	All	All	Protesters > 0	Protesters > 0
Election controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Demographic controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Dep. var. mean	0.161	0.295	0.161	0.240	0.160	0.293	0.160	0.815	6.598

Outcomes

Beliefs in 2010

Political Beliefs, ANES Survey 2010

Dependent variable	(1) Strongly supports the Tea Party movement, dummy	(2) Favorable view on Sarah Palin, dummy	(3) Feels outraged about the way things are going in country, dummy	(4) Opposes raising taxes on income >$250K, dummy	(5) Believes Americans today have less freedom compared to 2008, dummy	(6) Unfavorable feelings toward President Obama, dummy	(7) Average belief effect	(8) Reported likelihood of voting in the 2010 midterm election
Rainy rrotest	−0.057**	−0.057**	−0.046**	−0.058*	−0.065**	−0.046*	−0.13***	−0.067***
	(0.025)	(0.026)	(0.021)	(0.030)	(0.026)	(0.024)	(0.037)	(0.024)
Observations	1,146	1,140	1,142	1,140	1,138	1,145	—	1,092
R-squared	0.172	0.300	0.101	0.226	0.120	0.292	—	0.303
Election controls	Y	Y	Y	Y	Y	Y	Y	Y
Demographic controls	Y	Y	Y	Y	Y	Y	Y	Y
Dep. var. mean	0.120	0.311	0.174	0.228	0.438	0.245	—	0.701

Outcomes

Voting in 2010

THE EFFECT OF TEA PARTY PROTESTS ON VOTING BEHAVIOR, 2010 U.S. HOUSE

Dependent variable	(1) Republican Party votes	(2) Republican Party votes	(3) Democratic Party votes	(4) Democratic Party votes	(5) Republican Vote share	(6) Republican Vote share	(7) Republican Vote share
		Second-stage 2SLS estimates		Second-stage 2SLS estimates		Second-stage 2SLS estimates	
	Votes, % of county population				Votes, % of county votes		Votes, % of district votes
Rainy protest	−1.04***		−0.14		−1.55**		−1.92***
	(0.30)		(0.35)		(0.69)		(0.68)
% of pop. protesting scaling		12.59***		1.73		18.81**	
		(4.21)		(4.14)		(7.85)	
Observations	2,758	2,758	2,758	2,758	2,758	2,758	435
R-squared	0.88	—	0.87	—	0.89	—	0.91
Protesters variable	—	Mean	—	Mean	—	Mean	—
Election controls	Y	Y	Y	Y	Y	Y	Y
Demographic controls	Y	Y	Y	Y	Y	Y	Y
Dep. var. mean	14.97	14.97	12.76	12.76	52.47	52.47	50.86

Social media

- Increasing attention to understanding social media
- This is a new and exciting area
- I will describe one paper I've been working on, but much more to do here as well...

Role of celebrities

Alatas et al 2018: When Celebrities Speak: A Nationwide Twitter Experiment Promoting Vaccination in Indonesia

- We recruited 46 Twitter celebrities in Indonesia and convinced them to participate in an RCT on vaccination
- This is a case where design was tricky, since Twitter is a connected network.
- We wanted to answer two questions:
  1. Does an online social media campaign have offline effects?
  2. Does celebrity endorsement *per se* matter, or do celebrities only matter because they reach a large number of followers?
- How would you tackle each of these?

Our design

Identifying offline effects

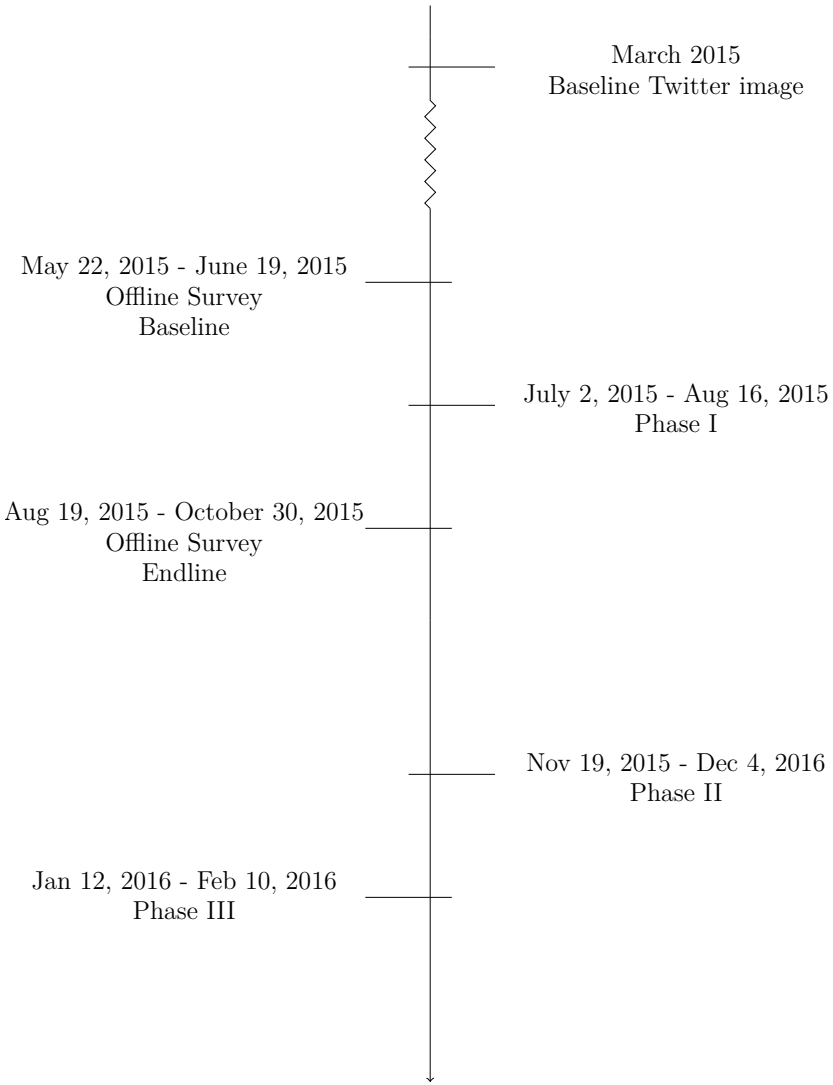
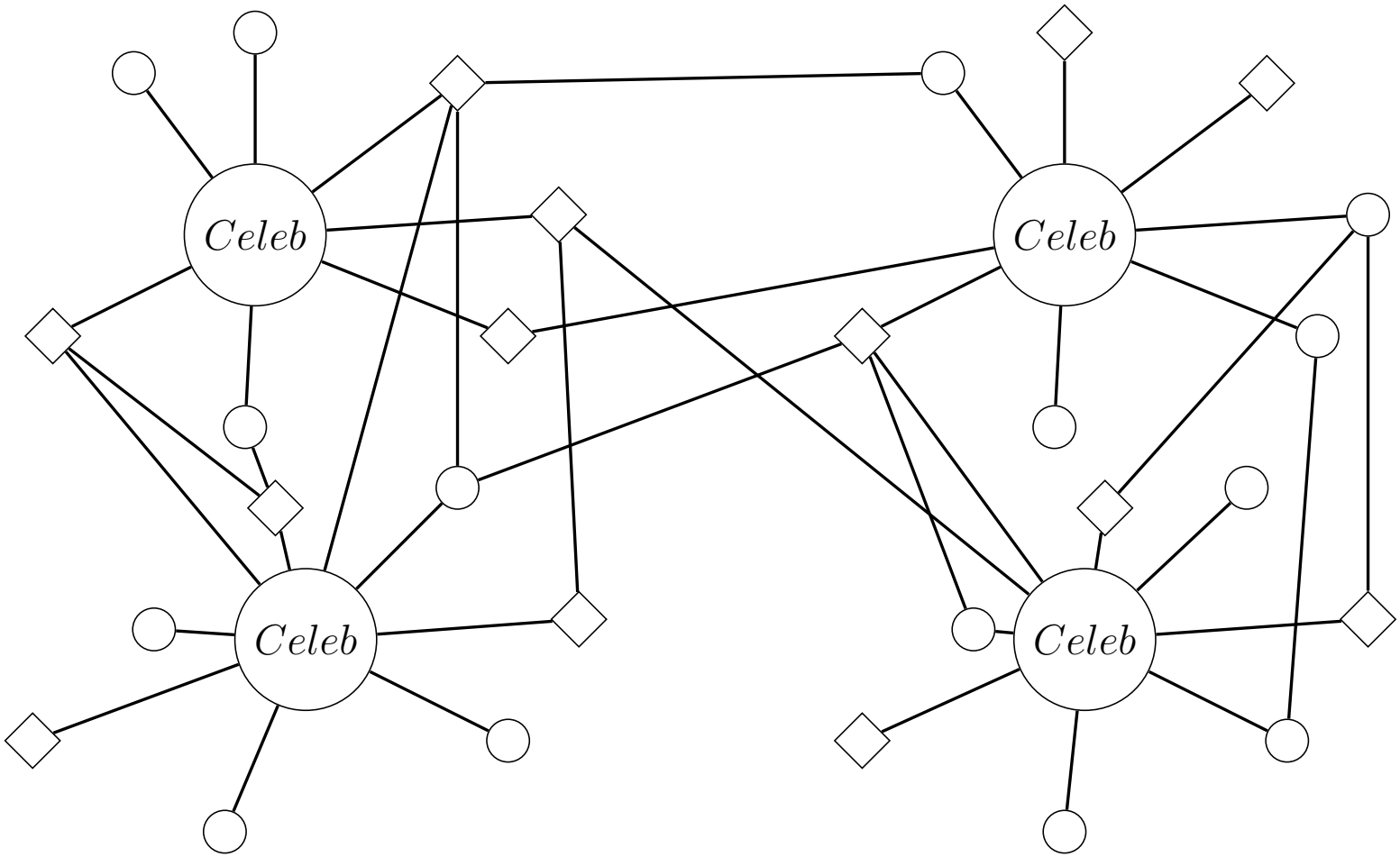


FIGURE 1. Timeline

Our design

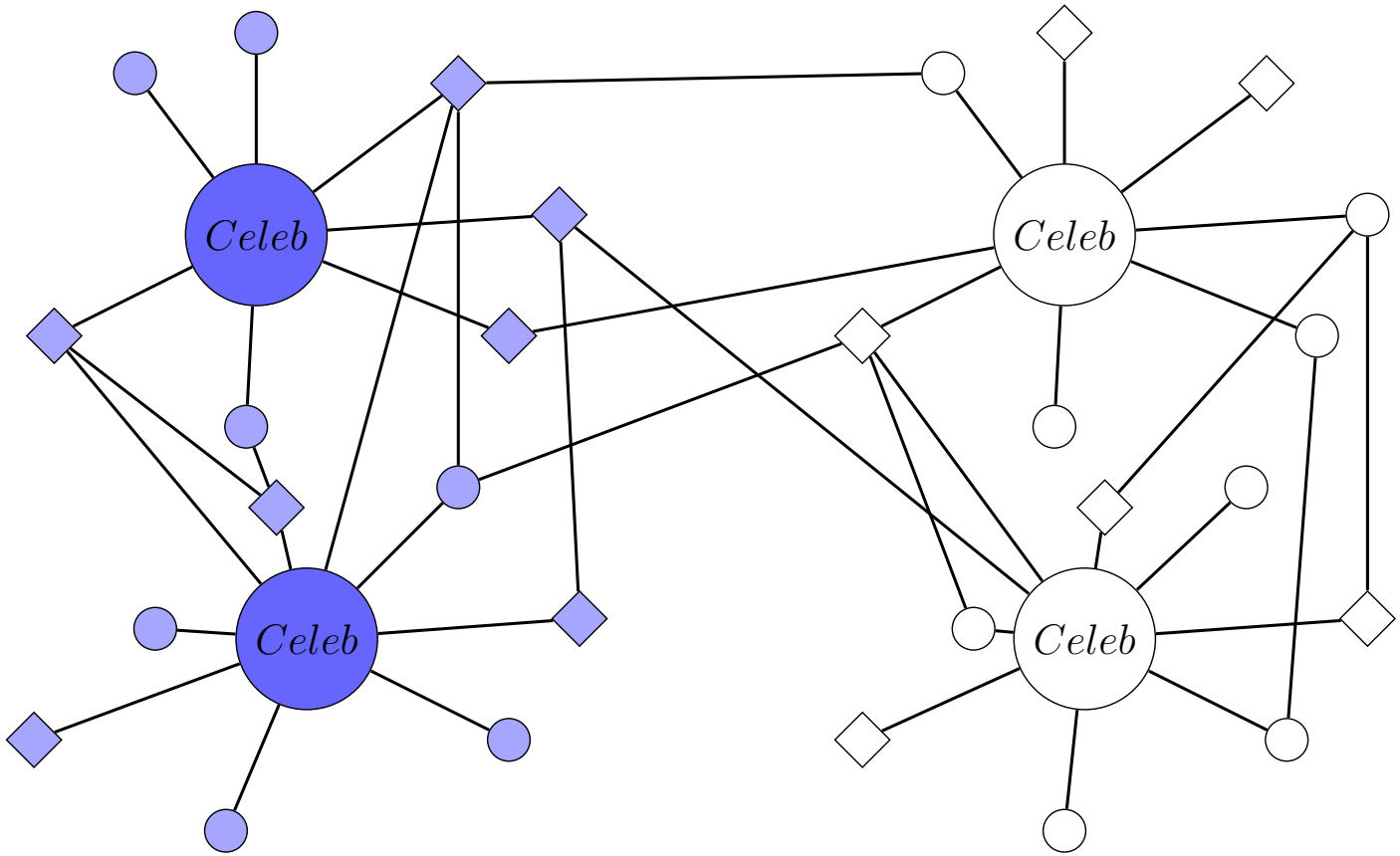
Identifying offline effects



(A) Twitter network with offline survey nodes denoted by diamond

Our design

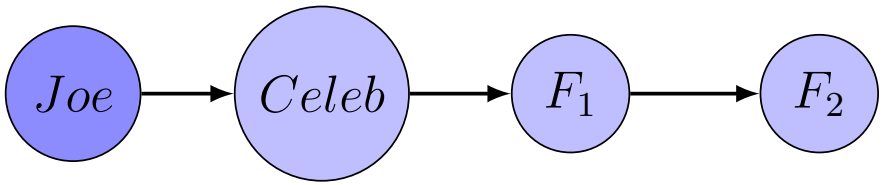
Identifying offline effects



(B) Phase I treatment celebrities and treated nodes and offline survey respondents colored in blue. Offline survey respondents beliefs affected by treatment measured by comparing blue and white diamonds.

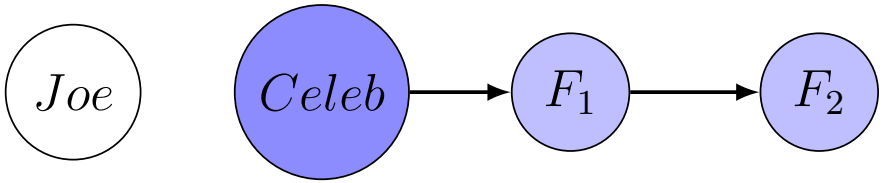
Our design

Identifying endorsement effects



(A) Message M originated by Joe

(B) F_2's observation



(C) Message M originated by Celeb

(D) F_2's observation

FIGURE 5. Identification of the endorsement through writing effect of celebrities.

Data and empirics

- Data comes from two sources
  1. Online data from Twitter. Which is public! And cheap.
  2. Offline data from a phone survey
- Offline analysis. Recall we randomize *celebrities* into Phase 1 or 2.
- Also, celebrities could chose (ex-ante) how many tweets we could send from their account.
- So what is random?
- Key is to control for *potential exposure* to tweets.
- Estimate:

$$f(y_i) = \alpha + \beta \cdot \text{Exposure to Tweets}_i + \gamma \cdot \text{Potential Exposure}_i + \delta' X_i + \epsilon_i$$

Offline Results

TABLE 2. Did people offline hear about the campaign?

Panel A: All respondents

VARIABLES	(1) Logit Heard of *#Ayoimunisasi*	(2) Heard from Twitter	(3) Poisson # of times heard from twitter
Std. Exposure to tweets	0.197	0.108	0.106
	(0.0980)	(0.0666)	(0.0529)
	[0.0443]	[0.106]	[0.0444]
	{.107}	{.046}	{.127}
Observations	2,164	2,404	2,441
Potential exposure control	✓	✓	✓
Double Post-LASSO	✓	✓	✓
Depvar Mean	0.0776	0.181	0.322

Offline Results

TABLE 3. Did people offline increase knowledge?

Panel A: All respondents

	(1)	(2)	(3)	(4)	(5)
	Logit	Logit	Logit		
VARIABLES	overall_knowledge_mean_std	Domestic	Free	Correct on Substitutes	Correct on Side-effects
Std. Exposure to tweets	0.0111	0.120	0.0549	-0.0391	0.0305
	(0.0273)	(0.0591)	(0.0687)	(0.0589)	(0.0624)
	[0.683]	[0.0424]	[0.424]	[0.506]	[0.625]
	{.541}	{.028}	{.629}	{.891}	{.751}
Observations	2,441	2,434	2,440	2,440	2,440
Potential exposure control	✓	✓	✓	✓	✓
Double Post-LASSO	✓	✓	✓	✓	✓
Depvar Mean	-1.72e-09	0.576	0.680	0.527	0.486

Offline Results

TABLE 5. Knowledge of network members' immunization behavior

Panel A: All respondents

VARIABLES	(1) Neighbor	(2) Friend	(3) Relative
Std. Exposure to tweets	0.231	0.0156	0.214
	(0.0814)	(0.0826)	(0.132)
	[0.00449]	[0.850]	[0.105]
	{.088}	{.778}	{.462}
Observations	1,642	1,626	1,564
Potential exposure control	✓	✓	✓
Double Post-LASSO	✓	✓	✓
Depvar Mean	0.775	0.813	0.923

Online results

TABLE 7. Reach vs. Endorsement: Value of Celeb Endorsement through Involvement measured by F_2 likes/retweets

VARIABLES	(1) Poisson # Pooled	(2) Poisson # Pooled	(3) Poisson # Retweets	(4) Poisson # Retweets	(5) Poisson # Likes	(6) Poisson # Likes
Celeb writes and tweets	1.003	0.776	0.970	0.602	1.133	1.152
	(0.251)	(0.701)	(0.259)	(0.922)	(0.572)	(1.027)
	[6.32e-05]	[0.268]	[0.000184]	[0.514]	[0.0476]	[0.262]
Observations	1,997	911	1,997	911	1,997	911
Phase control	✓	✓	✓	✓	✓	✓
Log #followers control	✓	✓	✓	✓	✓	✓
Message style control	✓	✓	✓	✓	✓	✓
Forced Joes only		✓		✓		✓

Summing up...

- Media can have important roles in policy
  - Through accountability channel
  - And as a coordination device.
- The latter aspect – coordination and the interplay with social media – is an active area of current research.